DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION
NORTHWESTERN LAND OFFICE
KALISPELL UNIT

WHITE'S BASIN TIMBER SALE
ENVIRONMENTAL ASSESSMENT

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Chapter 1 - PURPOSE OF PROJECT

I. PURPOSE AND NEED FOR ACTION

Introduction:

The Montana Department of Natural Resources and Conservation (DNRC), Kalispell Unit, proposes the White's Basin Timber Sale. The proposed action would harvest approximately 5 million board feet (MMBF) of timber, upgrade approximately 7.2 miles of existing roads, construct approximately 8.7 miles of new roads, and abandon approximately 3.5 miles of existing roads. Permanent access to the project area would be obtained in conjunction with the planning and implementation of this project. Easements would be exchanged with private landowners. The DNRC would acquire 3.2 miles of road across private lands and grant 1.9 miles of road to private landowners. A permanent access agreement would be secured across Forest Service lands for 3.4 miles of existing road. The project area encompasses parts of three sections totaling 1,017 acres and is located approximately 4 air miles south of Kalispell, Montana in Flathead County. (Refer to haul route and timber sale maps in Appendix A). Timber sale activities would likely begin in the summer or fall of 2003 and conclude in the year 2005

Table 1-1 State Lands included in the White's Basin project area:

Section	Township/ Range	Subdivision	Acres	Trust
8	T27N, R21W	Lots 3 & 4, SW1/4, W1/2SE1/4	316.37	P.B.
16	T27N, R21W	Lots 1,2,3 & 4 W1/2 E1/2, W1/2	625.12	C.S.
20	T27N, R21W	Lots 1 &2	76.00	P.B.

P.B. = Public Buildings; C.S.= Common Schools

Statement of Need:

The lands involved in this proposed project are held by the State of Montana in trust for the support of specific beneficiary institutions such as public schools, state colleges and universities, and other specific state institutions (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and the Department of Natural Resources and Conservation are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for these beneficiary institutions (Section 77-1-202, MCA). On May 30, 1996, the Department released the Record of Decision on the State Forest Land Management Plan (the Plan). The Land Board approved the Plan's implementation on June 17, 1996. The Plan outlines the management philosophy of DNRC in the management of state forested trust lands, as well as sets out specific Resource Management Standards for ten resource categories.

The Department will manage the lands involved in this project according to the philosophy and standards in the Plan, which states:

> *Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biologically diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream. In the foreseeable future, timber management will continue to be our primary source of revenue and our primary tool for achieving biodiversity objectives.*

Project Objectives:
In order to meet the goals of the management philosophy adopted through programmatic review in the State Forest Land Management Plan, the Department has set forth the following specific project objectives:

- Harvest 4 to 5 MMBF of sawtimber to generate revenue for the appropriate school grants.

- Move the forest toward appropriate or desired future conditions characterized by the proportion and distribution of forest types and structures historically present on the landscape.

- Improve the long term productivity of the timber stands by increasing vigor, reducing the susceptibility of stands to insect and disease infestations, and regenerating portions of the stands to promote appropriate species mixes.

- Reduce the fire hazard risk to private lands located adjacent to State lands by reducing basal areas, understory ladder fuels, and treating logging slash.

- Maintain and improve future opportunities for management activities and sustained revenue by developing a transportation plan that provides for legal access. .

II. PROJECT DECISIONS TO BE MADE

This environmental assessment (EA) will provide the basis for deciding what actions will be taken on the project area lands. The decision maker will select one of the alternatives outlined in this EA. The decision maker will consider:

- ♦ Does the action alternative presented meet the project objectives?
- ♦ Which alternative should be implemented?
- ♦ Will the alternative have any significant effects on the human environment?
- ♦ Does an Environmental Impact Statement need to be prepared?

III. PERMITS REQUIRED FOR IMPLEMENTATION

Easements will need to be obtained from the U.S. Forest Service, Flathead National Forest,

for road access into the area. The DNRC is currently working on a Cost Share Agreement with the USFS. Reciprocal Access Agreements will be entered into with private landowners to obtain road access into the project area.

IV. OTHER ENVIRONMENTAL REVIEW RELATED TO THE PROJECT

USDA, Flathead National Forest, Swan Lake Ranger District, Environmental Assessment: ISLAND UNIT FUELS REDUCTION PROJECT, February 2002.

V. SCOPE OF THE ANALYSIS

The scope of this Environmental Analysis (EA) was determined through comments received from DNRC specialists, adjacent landowners, organizations, industries, agencies and the general public. DNRC solicited participation in the White's Basin Timber Sale Proposal by advertising in newspapers and sending letters to adjacent landowners, agencies and organizations. DNRC accepted comments on the proposal for 30 days. Public comments can be found in the project files located at the Kalispell Unit Office.

DNRC specialists also conducted preliminary field reconnaissance to develop specific resource concerns and mitigations.

VI. RESOURCE CONCERNS

The major resource concerns were identified through the scoping process. The majority of all resource concerns were resolved by mitigation measures incorporated into the project design for the different action alternatives. The major resource concerns are briefly described below and explored in greater depth in chapters II, III, and IV. They are listed in no particular order of importance.

A. Vegetation

- Current species composition is significantly higher in Douglas – fir than was historically present. This higher composition is deterring establishment and development of large diameter western larch and ponderosa pine.

- High occurrences of dwarf mistletoe in Douglas-fir are present in portions of the project area. This is causing mortality and significant growth and vigor reductions in infected trees. Infected trees are also more susceptible to attacks by Douglas-fir bark beetles.

- Higher stand densities, abundant advanced regeneration of shade tolerant trees, and a significantly higher composition of Douglas-fir have increased the potential of a high intensity fire. This poses a threat to adjacent private lands surrounding the project area.

B. **Soil**

- Poor locations, steep grades, and inadequate road surface drainage on existing roads are contributing to increased erosion, rutting, and soil displacement.

- Long term soil productivity could be reduced depending on area and degree of physical effects from skidding and other logging activities, and the amount and distribution of course woody debris retained for nutrient cycling.

C. **Noxious Weeds**

- Timber harvesting and road construction activities may spread existing noxious weed populations and promote invasion and establishment of new populations.

D. **Road Management / Access**

- Poor locations, steep grades, and inadequate road surface drainage on existing roads are contributing to increased erosion, rutting, and soil displacement.

- The State of Montana does not currently have legal access to the project area. A transportation plan that will access the entire project area with maintainable roads is needed.

E. **Air Quality**

- Burning of slash from timber harvest and road building has the potential to reduce air quality.

- Dust created by timber harvesting and road construction activities may reduce air quality in the project area.

F. **Wildlife**

- Proposed activities could fragment habitat and influence biological diversity.

- Timber harvesting and associated activities could alter habitat or create disturbance that would be detrimental to sensitive, threatened and endangered wildlife species.

- Timber harvesting activities associated with this proposed project could reduce cover important for the survival of wintering elk, white-tailed deer, and mule deer.

- Activities associated with this proposed project could have adverse effects on elk and other big game security and affect hunter opportunity.

CHAPTER 2 - DESCRIPTION OF PROJECT ALTERNATIVES

I. INTRODUCTION

This chapter describes development of alternatives, including a no-action alternative and compares the alternatives by summarizing their environmental consequences. For this project, only one action alternative was developed and was designed to meet the project objectives. In addition to describing and comparing the alternatives, this chapter describes the alternative development process and mitigation and compensation measures that are common to the action alternative.

II. DEVELOPMENT OF ALTERNATIVES

A. Purpose of Alternatives

Action alternatives are developed to meet project objectives in alternative ways that would resolve resource issues. Because resolving some issues creates conflicts with others, it is often necessary to develop several action alternatives to accommodate these conflicts. For this project, all resource concerns were resolved by incorporating mitigation and compensation measures into the project design. As a result, only one action alternative was developed.

A no-action alternative provides the baseline for comparing the environmental consequences of other alternatives.

B. Description of Alternatives

This section describes the action alternative and the no-action alternative, proposed harvesting, logging methods, and mitigation and compensation measures that are specific to the action alternative.

1. No Action Alternative

Under this alternative, no timber would be harvested resulting in no revenue for the School Trust. Existing land uses such as road use and recreation would continue to occur. The DNRC would continue to pursue right-of-way acquisition dependent on available funding. No new roads would be built, existing roads would not be improved, and road access would not be controlled. Historic stand conditions would not be promoted and the potential for high intensity fire spread onto adjacent lands would continue and increase over time. Conditions favorable for the development of shade tolerant species would continue to deter the establishment of seral species and western larch would continue to decline in composition. Other land management activities could be proposed and undertaken in the future.

2. Action Alternative

If the action alternative were selected, 996 acres of timber would be harvested from 6 units

using commercial thinning, sanitization-group select, and shelterwood cutting methods. Silvicultural treatments will initiate the development of historic stand conditions by reducing stand densities and Douglas-fir composition to promote the development of larger diameter trees. The State will acquire permanent access to all portions of State land within the project area and develop a transportation system that will provide for management activities. Existing substandard roads would be permanently closed and reclaimed. Vegetation will be treated adjacent to private lands that border the project area to lessen the potential for high intensity fire spread onto these private lands.

Table 2-1 below summarizes the management activities that would occur under the two alternatives.

Project Actions	**Alternatives**	
	No Action	**Action**
Acres of State Land involved	1,017	1,017
Acres to be logged	0	996
Harvest volume (MMBF)	0	4.5
Fire Hazard Reduction adjacent to private lands	0 acres	18 acres
Road Actions		
Miles of Easements Granted*	1.9	1.9
Miles of Easements Acquired*	6.6	6.6
Miles of open road	6.4	0
Miles of new construction	0	8.7
Miles of road reconstructed**	0	7.2
Miles of road to be closed	0	3.5

*Acquisition of right-of-ways would depend on funding.
** Refer to Transportation Planning/ Road Management Effects in Chapter 4 for a description on standard of reconstruction between No Action and Action.

III. MITIGATIONS TO BE IMPLEMENTED

The following mitigation measures were developed to reduce the potential impacts to the identified resource concerns. The resource concerns were identified through the scoping process and from DNRC resource specialists (see public scoping process Table 1-1 on page 3). These mitigation measures would be applied if the action alternative were chosen:

A. Vegetation

- Reduce composition of shade tolerant species (Douglas-fir) and reduce stand densities to provide better growing conditions to allow residual trees to increase in growth and vigor.
- Remove dwarf mistletoe infected trees to improve stand health and reduce the probability of bark beetle attacks.
- Treat areas adjacent to private land to reduce the potential of high intensity fires by reducing stand densities, removing ladder fuels, and treating logging slash.
- Plant western larch as appropriate in openings that may be created to assure presence of larch in future stand composition.

B. Soil

- Restrict logging activities to periods when the soil moisture is less than 20%, frozen to a depth of four inches, or snow covered to a depth of 18 inches loose or 9 inches packed to minimize compaction, displacement and rutting.
- Existing skid trails and roads will be utilized for skidding wherever possible to reduce the amount of ground disturbance. Skid trails constructed will be designed to avoid concentrating runoff and minimize erosion.
- The logger and sale administrator will agree to a general skidding plan prior to harvest operations in order to limit ground disturbance due to skidding operations.

  A transportation system will be located and established to provide adequate surface drainage and reduce erosion.
- Retain 10-15 tons of coarse woody debris after harvest for nutrient cycling to maintain site productivity.

C. Wildlife

- Cease all operations and consult with a DNRC biologist for further mitigations should a nesting pair of eagles be observed within one mile of any project-related activities.

- To provide for wildlife security, minimize the number of roads (open and closed), by slashing old roads and skid trails to reduce the potential for foot and unauthorized motor vehicle traffic.

- Suspend operations and temporarily restrict use of roads within a 1 mile of any known active wolf den or within 1/2 mile of a suspected rendezvous site.

- Retain connective corridors of heavy forest cover when possible to maintain travel routes, visual screening and partial cover for elk and deer.

- Retain patches of dense vegetation when possible to provide some thermal cover/snow intercept capacity and big game cover.

D. **Noxious Weeds**

- All equipment used in road work and harvesting operations will be cleaned of plant parts, dirt, and weed seed prior to entry to prevent the possibility of seed dispersal by equipment.

- All newly disturbed areas of soil associated with roadwork will be promptly grass seeded with a site adapted seed mix to deter the establishment of noxious weeds and to prevent erosion.

- Monitor project area and contract herbicide spraying as needed to control spot outbreaks of noxious weeds.

E. **Air Quality**

- Slash burning will be conducted only when weather and air quality conditions are favorable and as allowed under the cooperative Montana Airshed Group rules and regulations.

- In order to limit adverse effects created by dust from hauling operations, winter logging and hauling when the humidity is higher will be implemented when feasible.

F. **Road Management/ Access**

- Close and reclaim existing substandard roads that are in poor locations.

- Develop a transportation system that provides adequate surface drainage and an easily maintained road to access the entire project area.

- Acquire permanent, legal access to the project area by reciprocal access agreements with private landowners and a Cost Share Agreement with the US Forest Service.

IV. COMPARISON OF ALTERNATIVES AND ENVIRONMENTAL CONSEQUENCES

The following table (2-2) compares the alternatives by summarizing their environmental consequences. The table lists the major resource concerns and compares the related effects for each alternative. The scientific basis for the environmental effects summarized in the table, are discussed in more detail in Chapters 3 & 4.

Table 2-2 – Environmental Effects Table

Resource	Issue	No Action Alternative	Action Alternative
VEGETATION	Restoration of historic stand composition	A continuing increase in shade tolerant composition over time. Residual overstory western larch will decrease.	Decrease in shade tolerant composition by harvesting Douglas-fir and leaving the majority of healthy western larch. Provide for development of larger diameter trees and regeneration of western larch.
	Fire Hazard Risk	Continued and increasing risk of high intensity fire spread from State lands. Potential loss of revenue to Trust by catastrophic fire.	Decreased risk of high intensity fire spread from State lands due to basal area reduction, thinning of sub-merchantable trees, and treatment of residual fuels. Increase potential of long term income from area by increased health and vigor of residual stands with decreased potential of stand replacement fire.
	Insect and Disease	Dwarf Mistletoe: Heavy to moderate infection on approximately 600 acres. Continued decrease in growth and vigor due to infestation and spread.	Dwarf Mistletoe: Improved growth and vigor on approximately 600 acres by removing infected trees. Decreased spread by removing infected trees and promoting regeneration of western larch.
		Douglas-fir bark beetle: Increased potential for bark beetle infestation and occurrence due to poor vigor.	Douglas-fir bark beetle: Decrease potential for bark beetle infestation by removing weakened and susceptible trees.

	Noxious weed encroachment	Continued spread along roads and trails. Cooperative agreement with Flathead County will include spraying of existing populations.	Increase in risk of spot infestation with increases in bare mineral soil exposure from logging operations. Cooperative agreement with Flathead County will include spraying of existing populations.
SOILS	Soil productivity-Effects from compaction, displacement and erosion	There is currently 7.2 miles of existing roads. Approx. 3.44 miles on US Forest Service lands, 0.93 miles on private lands, and 2.83 miles on State lands. These roads would remain in current condition and would not be upgraded to meet current BMP's.	An additional 6.2 miles of new roads would be constructed on State lands and 2.47 miles of new construction on private lands. This would provide a transportation plan that provides access to all State lands in the project area. Acres would be taken out of productivity in new road locations.
	Road condition/ standards	3.5 miles of existing roads located on State lands with steep grades and inadequate surface drainage would continue to cause erosion and would not be reclaimed.	3.5 miles of existing substandard roads would be reclaimed and closed. New roads would be constructed with adequate surface drainage and located on lesser grades resulting in a more easily maintained road system.
WILDLIFE Coarse Filter	Habitat fragmentation, patch dynamics, and connectivity	No changes in fragmentation. Development adjacent to state parcels has fragmented forested patches. No changes in patch size, shape, or connectivity are anticipated.	No changes in fragmentation-mature, open stands would blend with remaining forested patches and recently harvested stands. Negligible changes in patch size, shape, and connectivity.
WILDLIFE T & E Species	Habitat alteration	Stands are not providing habitat for any Threatened or Endangered Species. Future use is not anticipated.	Same as No Action Alternative
WILDLIFE Sensitive Species	Habitat alteration	Increases in shade-tolerant Douglas-fir and a decrease in shade-intolerant western larch would reduce sustainability and quality of pileated woodpecker habitat over time.	Increased stand openness would be less suitable for pileated woodpeckers. Retention and recruitment of shade-intolerant western larch would improve long-term habitat quality.

WILDLIFE Big Game	Big game winter habitat	Continued succession would improve thermal cover while decreasing forage production. Current levels of human disturbance may reduce winter use.	Thermal cover would be reduced and forage production increased within winter range. Limiting current levels of human disturbance would likely increase security.
	Elk security and hunter opportunity	Neither elk security nor public access exists on the state sections.	Improve elk security by limiting public access. Hiding cover would improve over time.
HYDROLOGY	Water Quality	3.5 miles of existing roads located on State lands would continue to cause erosion and would not be reclaimed or closed. Road access would be uncontrolled.	3.5 miles of existing roads would be reclaimed and closed. New roads would be constructed and located to reduce erosion and make for a more easily maintained road system. Access would be controlled.
AIR QUALITY	Smoke production from burning slash	No slash would be burned. Current levels of smoke production would continue.	Short term increases in smoke from burning of timber slash.
	Dust production from log hauling	No dust would be produced from log hauling.	There would be a short term increase in dust production when log hauling occurs. In order to limit adverse effects created by dust from hauling operations, winter logging and hauling when the humidity is higher will be implemented when feasible.
TRANSPORTATION PLANNING	Access	Pursue acquiring permanent legal access to all State sections in the project area. It would include acquiring easements from a private landowner, a private timber company, and the US Forest Service.	Same as No Action Alternative dependent on available funding.

	Reconstruction/ Maintenance	Minimal maintenance to improve road drainage and spot repairs. Would probably not meet long term road maintenance standards. No closure and reclamation of existing roads. New roads would not be constructed and access to all lands within the project area would not be realized.	3.5 miles of existing roads would be closed and reclaimed. Access to the project area would be controlled, and roads would be maintained. A transportation plan that provides access to all State lands in the project area would be constructed.

Chapter 3 - EXISTING ENVIRONMENT

I. INTRODUCTION

This chapter describes the existing environment within the project area where the proposed action would occur. This chapter provides the baseline for comparison of the environmental effects discussed in Chapter 4.

The Whites Basin Timber Sale Project area lies approximately 5 air miles south of Kalispell, Montana in Flathead County. The sections involved in the project include sections 8, 16, and 20, T27N, R21W. Total State owned acreage within the project area is 1,017 acres.

Section 16 is bordered on the north and south by small private lands that have been developed for residential home sites. The east and west boundaries of section 16 are bordered by large private landowners. Section 8 is bordered on the north and east by residential home sites and on the west and south by large private landowners. Section 20 is bordered on the north by private lands and by US Forest Service lands on the remaining boundaries.

Elevation within the project area ranges from 3200 to 4200 feet. Aspects and topographic features vary widely within the project area. There is no surface water located within the project area.

II. VEGETATION

Landscape Analysis

A. Existing Forest Condition

The State Forest Land Management Plan (SFLMP) directs DNRC to promote biodiversity by taking a coarse filter approach thereby favoring an appropriate mix of stand structures and compositions on State land. Components used to determine an appropriate mix of stand structures at the landscape Unit level include cover type proportions, age class distributions, stand structural characteristics, and the spatial relationships of stands - i.e. size and location on the landscape.

1. Kalispell Unit

Estimates of Current and appropriate cover types were determined at the Landscape Level for the entire Kalispell Unit. The Kalispell Unit's Stand Level Inventory (S.L.I.) was used in conjunction with John Losensky's 1997 report *Historical Vegetation of Montana* to compare what this landscape may have looked like historically in regards to amount and distribution of cover types. To date, 100% of the classified forestlands on the Kalispell Unit have been inventoried.

Table 3-1: Current and Appropriate Cover Types for the Kalispell Unit

Cover Type	Current Cover Type (Acres)	Appropriate Cover Type (Acres)	Current Type Minus (-) Appropriate Type (Acres)
ALP/NC	1795.9	250.8	1545.1
DF	1315.2	1736.4	(421.2)
LP	1813.9	1358.7	455.2
MC	10803.1	2849.6	7953.5
PP	11311.5	11367.3	(55.8)
WL/DF	22153.0	31659.7	- (9506.7)
WWP	2248.7	2322.7	(74.0)
OTHER	327.6	223.7	103.9
TOTAL	51768.9	51768.9	

ALP/NC = Alpine fir/ upper elevation non-commercial. DF = Douglas-fir. LP = Lodgepole pine. MC = Mixed conifer. PP = Ponderosa pine. WL/DF = Western larch/ Douglas-fir. WWP = Western white pine. Other = non stocked lands, or hardwood forests. The Current Type minus Appropriate Type column above lists the excess and deficit (-) acres for each Cover Type.

2. Whites Basin Project Area

Measured inventory plots were taken across the entire project area to determine quantitative information about the existing stands. The data collected from the project is summarized in Table 3-2.

Table 3-2: Merchantable Timber Characteristics by Section for White's Basin

Merchantable Timber Characteristics									
Section	Species comp	Gross Vol/AC	TPA	BA/AC	Avg. D.B.H.	Avg. Age	Curr. Type	Appr. Type	Habitat Type
08	DF-75%, WL-22%, PP-3%	11.5	143	104	11.2	100	WL/ DF	WL/ DF	PSME/SYAL PSME/PHMA
16	DF- 83%, WL-16%, PP-1%	12.15	234	112	7.6"	100	WL/ DF	WL/ DF	PSME/SYAL, PSME/LIBO
20	DF- 83%, WL-16%, PP-1%	11	234	112	10	140	WL/ DF	WL/ DF	PSME/SYAL PSME, LIBO

SPECIES COMP= species composition: DF= Douglas-fir, PP= ponderosa pine WL= western larch,
GROSS VOL/AC= gross volume per acre measured in thousand board feet (MBF); TPA= trees per acre; **BA/AC**= basal area per acre measured square feet; **AVG DBH**= average diameter at breast height; **AVG AGE**= average age in years; **Habitat Types****= PSME/SYAL= Douglas-fir/snowberry, PSME/PHMA= Douglas-fir/ ninebark, PSME/LIBO= Douglas-fir/twinflower; **See Habitat Map in Appendix.

B. Cumulative Effects to Forest Condition

1. Kalispell Unit

Table 3-1 was used to assess the cumulative impacts on the Kalispell Unit forest conditions. The acres of current cover types versus "desired future" or appropriate cover types indicate no change in the amount of appropriate cover types. All stands within the project area are currently and appropriately typed as western larch/Douglas-fir. Although the stands currently meet the criteria for their appropriate stand classification, conditions within these stands have changed significantly over the last 80 years. A major species composition shift has taken place. Shade tolerant (Douglas-fir) composition has increased significantly and is resulting in denser stands with increased insect and disease problems. This is due to a number of factors. Past timber harvests removed the majority of dominant seral species (western larch and ponderosa pine). In the absence of fire, conditions for regeneration of seral species are not present. If the current trend continues, the seral component will continue to decline until the area is comprised of almost all shade tolerant species. This will put the Kalispell Unit into more of a deficit in the Western larch/Douglas-fir cover type.

2. Stand History

An inventory of the project area was done in 1924. Merchantable tree volume was determined by species and notes were recorded in regards to overall forest health and understory composition. Table 3-3 summarizes the inventory data from 1924 for each parcel within the project area.

Table 3-3

1924 Inventory Summary					2002 Inventory Summary				
Species	Sec. 8	Sec. 16	Sec. 20	% of total all parcels	Sec. 8	Sec. 16	Sec. 20	% of total all parcels	% Change
Western larch	880 MBF	3,631 MBF	470 MBF	66 %	768 MBF	1,253 MBF	134 MBF	19%	-47
Douglas-fir	375 MBF	1,389 MBF	150 MBF	25 %	2,473 MBF	5,865 MBF	694 MBF	79%	+54
Ponderosa pine	135 MBF	527 MBF	15 MBF	9%	102 MBF	97 MBF	8 MBF	2%	-7
Totals	1,390	5,547	635	100	3,343	7,215	836	100	

By comparing the 1924 inventory to the current data, it is evident that a major species shift has occurred during the past 80 years. Two major harvests occurred within the project area in the last 60 years. The first harvest occurred from 1942 to 1944 and removed approximately 6,648 MBF of western larch and Douglas-fir. About 46 MBF of ponderosa pine was removed. The majority of the dominant western larch and Douglas-fir was removed in this initial harvest. A second harvest occurred from 1972 to 1973 and removed 191 MBF of western larch, 1,065 MBF of Douglas-fir, and 5 MBF of ponderosa pine. Field reconnaissance indicates that the earlier harvest focused on removing the majority of the largest seral species. The second harvest removed the understory trees that released after the first harvest. There is currently a lack of seral regeneration in the understory. Dwarf mistletoe is widespread and has adversely affected the growth, vigor, and overall health of overstory and understory Douglas-fir.

C. **Adjacent Land**

The adjacent land is comprised of small private, Plum Creek Industrial lands, and U.S. Forest Service- Flathead National Forest lands. Numerous small lots with homes border the project area to the north, south, and east. Large, private lands and U.S. Forest Service lands are located to the west. The small private ownership has been cleared to varying degrees to accommodate low density residential homes. The larger private lands have been logged within the past 10 years. U.S. Forest Service lands have been managed for timber and portions harvested within the past 5 years.

D. **Old Growth**

Old growth will be managed to meet biodiversity and fiduciary objectives in the SFLMP, pursuant to state law.

As per the State Land Board's decision in February, 2001, the DNRC adopted the definitions for old growth based on minimum number and size of large trees per acre and age of those trees as noted in Old-Growth Forest Types Of The Northern Region, by P. Green, J. Joy, D. Sirucek, W. Hann, A. Zack, and B. Naumann (1992, USFS Northern Region, Internal Report).

There are no stands within the project area that meet DNRC's definition of old growth.

E. **Insect and Disease Activity**

Inventory data and field reconnaissance were used to identify and quantify insect and disease activity.

1. **Bark Beetles**

Current Conditions: Douglas-fir beetle (*Dendroctonus pseudotsugae*) and mountain pine beetle (*Dendroctonus ponderosae*) are the two most common bark beetles found within the project area. Mortality has been occurring in small patches and in individual Douglas-fir trees throughout the project area. Due to the small amount of ponderosa pine within the project area, mountain pine beetle activity has been very low.

Cumulative Effects: At the landscape level, the shift in cover types from open ponderosa pine and western larch stands to denser stocked stands has increased the risk of larger scale bark beetle outbreaks than in the past. Within the project area, Douglas-fir beetle activity is increasing. The high percent of dwarf mistletoe infection has weakened trees and predisposed them to bark beetle attacks. High stands densities, low vigor, and high compositions of Douglas-fir have further increased the risk of bark beetle attacks on a large scale.

4. **Dwarf Mistletoe**

Current Conditions: The project area has a high occurrence of dwarf mistletoe in Douglas-fir (*Arceuthobium douglasii*). Large areas (1-5 acres) and individual trees have moderate to severe infection throughout the project area. Infection is causing poor vigor and is predisposing trees to bark beetle attacks. Infection is severe enough to cause mortality in some areas. It is estimated that at least 50% of the Douglas-fir understory is infected.

Cumulative Effects: At the landscape level, past fire suppression and logging have had an effect on the dwarf mistletoe populations. Past partial harvests that created multi-storied stands and fire suppression that has caused a shift in cover types have increased the severity of mistletoe infections on the landscape. Within the project area, dwarf mistletoe infection will continue to spread and cause poor vigor and mortality. Trees will be predisposed to other pathogens.

F. **Sensitive, Threatened, and Endangered Plants**

A review of the records from the Montana Natural Heritage Program indicated no plant species of special concern were identified within the project area.

G. **Noxious Weeds**

Current Condition: Noxious weed species identified through reconnaissance and work on the project area include spotted knapweed, orange hawkweed, and scattered leafy spurge. The majority of the noxious weed populations were found along existing open roads in all State owned sections and along private roads as well.

Flathead County and DNRC have a "Cooperative Integrated Noxious Weed Management Agreement" in compliance with the state law known as the County Weed Control Act (Section 7-22-2151, MCA). An annual coordination meeting between the County Weed Control District and DNRC allows for identification of weed problems; and determines an integrated approach at managing and treating priority areas as related to county and DNRC weed control goals. Control of noxious weeds within the White's Basin project area will be part of this agreement and incorporated into the transportation plan.

Cumulative Effects: At the landscape level, past activities have had a big impact on noxious weed populations. Management activities such as logging, road building, livestock grazing and recreation have led to increases in the amount and distribution of noxious weeds on the Kalispell Unit. This has occurred at the project level as well. Past management activities such as logging, road building, firewood cutting and recreation have led to invasion and establishment of noxious weed populations in the project area.

III. SOILS

A. General Description

The majority of the project area is characterized by glaciated, moderate sideslopes (20% – 40%) mantled with glacial till. Drainage patterns are dendritic and widely spaced. The subsurface is comprised of calcareous, silty, dense, brittle, glacial till. Soils have medium textured surface layers that form in thin layers of volcanic ash influenced loess, 2-7 inches thick. Subsoils contain 15 to 50 percent rounded rock fragments. Lower soils contain 15 to 35 percent lime. 20 percent dissimilar soils can be included in the soil composition. Rock outcrops are present and are common on ridges. Lower slopes and draw bottoms are characterized by glacial moraines and rolling glacial till deposits. Composition is similar to sideslopes. A representative soil profile for the project area would contain a surface layer about 4 inches thick. The surface layer is comprised of Typic Eutroboralfs, loamy-skeletal, mixed soils that have a yellowish, brown silt loam. The lower surface is a pale brown, gravelly silt loam about 18 inches thick. The upper subsoil is yellowish brown, gravelly silt loam about 18 inches thick. The lower surface is calcareous, yellowish brown, extremely gravelly silt loam to depths of 60 inches or more.

B. Soil Productivity

Productivity is moderate on most soils within the project area. It is well suited for ground based operations. Trees can be susceptible to windthrow in some areas because lime in the lower subsoil limits root penetration. The erosion hazard on roads and skid trails is moderate. Sediment delivery efficiency is moderate.

C. Cumulative Effects to Soil Productivity

Past management activities have had an effect on the soil productivity in the project area. Road building activities and logging have reduced the soil productivity in some areas. Downed woody debris, important for nutrient cycling, has been reduced in some parts of the project area due to past timber harvesting (both commercial and domestic firewood cutting).

Uncontrolled access within the area has increased maintenance problems on roads and increased the amount of off road use and illegal firewood cutting.

IV. WILDLIFE

A. Introduction

The Department of Natural Resources and Conservation (DNRC) attempts to promote biodiversity by taking a "coarse filter" approach which favors an appropriate mix of stand structures and compositions on state lands (DNRC 1996). Appropriate stand structures are based on ecological characteristics (e.g., land type, habitat type, disturbance regime, unique characteristics). A coarse filter approach assumes that if landscape patterns and processes are maintained that are similar to those with which the species evolved, then the full complement of species will persist and biodiversity will be maintained (DNRC 1996). This coarse filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape. DNRC cannot assure that the coarse filter approach will adequately address the full range of biodiversity, and therefore DNRC also employs a "fine filter" approach for threatened, endangered, and sensitive species as well. The fine filter approach focuses on a single species' habitat requirements (DNRC 1996).

B. Methods

To assess the existing condition of the proposed project area and the surrounding landscape, a variety of techniques were used. Field visits, scientific literature, stand level inventory (SLI) data, aerial photographs, Montana Natural Heritage Program data, and consultations with other professionals provided information for the following discussion and effects analysis. For this analysis, the 11 whole or partial sections surrounding the proposed project area were considered as the cumulative effects analysis area (Figure W-1) for the majority of effects determinations for wildlife species of concern.

C. Coarse Filter

1. Overview

The majority of terrestrial vertebrates that were present at the time of European settlement likely still occur in the proposed project area. Species that rely on special habitat elements such as burned areas may not be present or are in decline due to the decline of these elements across the landscape.

2. Influence of Fire

Historically, wildfire was the primary disturbance factor shaping the stands in the proposed project area and substantial portions of the forested communities in this area (Losensky 1997). Forested patches on the landscape were likely a mosaic of stands that established following a number of disturbances of varied type, intensity, and magnitude. Frequent fire return intervals

(5-25 years) reduced encroaching Douglas-fir and maintained western larch stands in more open, park-like conditions with fire-resistant mature trees and small patches of even-aged regeneration. Reduction in natural fire frequency and severity through fire suppression in the last 100 years has led to denser stands with a higher proportion of stagnated shade-intolerant tree species, like Douglas-fir.

Fire-associated species such as the black-backed woodpecker (*Picoides arcticus*) are probably less abundant on the landscape currently than would typically have been expected under natural fire regimes, and species preferring dense coniferous in-growth of shade tolerant tree species (such as Douglas-fir and grand fir) under mature forest canopy likely benefited.

3. Stand-Age and Cover-Type Characteristics

Mature and old stands are essential habitat for wildlife species associated with the late seral stages of forest stand development for all or some life requirements. A partial list of these species includes pileated woodpeckers (*Dryocopus pileatus)*, American marten (*Martes americana*), brown creepers (*Certhia americana)*, and winter wren (*Troglodytes troglodytes*). The proposed project area currently contains mature stands of Douglas-fir/western larch, however there are no stands in the proposed project area that meet DNRC's definition of old growth (see Old Growth Section). On the Kalispell Unit, there is less acreage in western larch/Douglas-fir cover types and more acres in mixed conifer types than perceived historical conditions. The reasons for this trend revolve around past management and fire suppression.

4. Patch Characteristics and Connectivity

Encroachment by shade-tolerant tree species due to modern fire suppression has led to more extensive and continuous patches of forests, thereby reducing natural habitat fragmentation. Through this process, patch size has likely increased and the small openings on the landscape generated by the small fire disturbances have been largely eliminated. Fire suppression has also increased the potential for large stand-replacing fires that could propagate larger patch sizes than found under historically frequent, low intensity fire regimes.

Not only does habitat patch size influence use by various wildlife species, but the arrangement and juxtaposition can also influence habitat quality for some wildlife. Some species benefit from the transitional edge created between 2 or more habitat types, while others are adversely affected by these edges or the species that frequently use these edges. Edge habitats, that were a by-product of small fire disturbances, have also been largely removed by modern fire suppression. Some species are adapted to thrive near edge habitats, while others are adversely affected by the presence of edge or by the presence of other animals that prosper in edge habitats.

Some wildlife species, such as fisher (*Martes pennanti*), do not cross large, non-forested habitats when traveling between patches of suitable habitat. Therefore, landscape connectivity of forested habitats types is important for facilitating movement for these species. Connectivity under historical fire regimes likely remained relatively high as fire differentially

burned various habitats across the landscape. Today, the mosaic of ownership and diversity of past management within the general vicinity of the proposed project area have compromised connectivity to a large degree.

D. Fine Filter

In the fine-filter analysis, individual species that are recognized to be of special concern are evaluated. These species are addressed below and include Federally "threatened" or "endangered" species, species listed as "sensitive" by DNRC, and species managed as "big game" by Montana Fish Wildlife, and Parks.

1. Threatened and endangered species

Four species indigenous to Montana area classified as "Threatened" or "Endangered" under the Endangered Species Act of 1973. The bald eagle, grizzly bear, and Canada lynx are listed as "Threatened", while the gray wolf is listed as "Endangered".

a. Bald eagle *(Haliaeetus leocucephalus)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to bald eagles.

Strategies to protect the bald eagle are outlined in the Pacific States Bald Eagle Recovery Plan (USFWS 1986) and the Montana Bald Eagle Management Plan (Montana Bald Eagle Working Group 1994). Management direction involves identifying and protecting nesting, feeding, perching, roosting, and wintering/migration areas (USFWS 1986, Montana Bald Eagle Working Group 1994). The nearest bald eagle nests were known to occur within 7-8 air miles of the project area south east of the proposed project area near Flathead Lake. Occasional use of the proposed project area by foraging bald eagles might occur during the winter when eagles are more dependent upon big game carrion. Overall, habitats found within the state parcel and surrounding vicinity have low inherent value for bald eagles. No cumulative or localized effects that would positively or negatively influence bald eagles would be expected to occur as a result of this proposed project. Therefore, this species will not be considered further in this analysis.

b. Grizzly bear *(Ursus arctos)*

Issue: There is concern that timber harvesting and associated activities could alter habitat or create disturbance that would be detrimental to grizzly bears.

Grizzly bears are wide-ranging mammals that use forested upland habitats. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. The project area is 11-12 miles southwest of the North Continental Divide Ecosystem Recovery Zone (USFWS 1993), contains a limited amount of preferred grizzly bear habitats (25 acres of big game

winter range), and there have been no documented observations of grizzly bears in the proposed project area. Grizzly bears could, however, show up in the proposed project area at any time. Since this proposed project is not expected to affect grizzly bears, this species will not be considered further in the analysis.

c. Gray Wolf *(Canus lupus)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to the gray wolf.

The Northern Rocky Mountain Wolf Recovery Plan defines 3 recovery areas (USFWS 1987, USFWS et al. 2002). The proposed project area falls within the Northwest Montana Wolf Recovery Area.

The wolf is a wide-ranging species whose habitat contains adequate vulnerable prey and minimal human disturbance. Primary prey species in northwestern Montana are white-tailed deer, elk, moose, and mule deer. The distribution of wolves is strongly associated with white-tailed deer winter range.

Wolves choose elevated areas in gentle terrain near a water source (valley bottoms), close to meadows or other openings, and near big game wintering areas for dens and rendezvous sites. The project area contains limited big game winter range and is on moderate terrain, however there has been no documented wolf activity near the project area, and high levels of human disturbance would likely eliminate this area from potential future use as the wolf populations increase through time. Wolves might pass through the area sporadically. Nearest documented wolf activity has been in Brown's Meadows 18-20 air miles south and west of the project area (T. Meier, USFWS, pers. comm. Sept. 2002). Since this proposed project is not expected to affect wolves, this species will not be considered further in the analysis.

d. Canada Lynx *(Felis lynx)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to lynx.

Lynx are associated with subalpine fir forests generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). The proposed project area ranges from approximately 3,200 to 4,200 feet and is dominated by Douglas-fir and western larch, with some ponderosa pine. Typical lynx denning habitat consists of mature spruce-fir with abundant coarse woody debris; typical lynx foraging habitat consists of younger coniferous forests with an abundance of snowshoe hares. The proposed project area contains neither subalpine fir nor younger areas for foraging. Since this proposed project is not expected to affect Canada lynx, this species will not be considered further in the analysis.

2. Sensitive species

When conducting forest-management activities, the SFLMP directs DNRC to give special consideration to several sensitive species. These species are sensitive to human activities, have special habitat requirements that might be altered by timber management, or might become listed under the Federal Endangered Species Act if management activities result in continued adverse impacts. Because sensitive species usually have specific habitat requirements, consideration of their needs serves as a useful "fine filter" for ensuring that the primary goal of maintaining healthy and diverse forests is met.

A search of the Montana Natural Heritage Database documented no sensitive species occurrence records in the proposed project area or within 1 mile. Each sensitive species was either included in the following analysis or was removed from further analysis because either suitable habitat does not occur within the project area or proposed activities would not affect their required habitat components (Table W-1).

a. Pileated Woodpecker *(Dryocopus pileatus)*

Issue: There is concern that timber harvesting could alter habitat or create disturbance that would be detrimental to the pileated woodpecker.

The pileated woodpecker is listed by DNRC as a sensitive species because of the important ecological niche it occupies (DNRC 1996). Pileated woodpeckers excavate the largest cavities of any woodpecker. These cavities are frequently used in subsequent years by many other species of birds and mammals. Preferred nest trees are western larch, ponderosa pine, cottonwood, and aspen, usually 20 inches dbh and larger. Pileated woodpeckers primarily eat insects, mainly carpenter ants, inhabiting large downed logs, stumps, and snags. Nesting habitat for pileated woodpeckers consists of mature stands below 5,000 feet in elevation with 100-125 ft^2/ac basal area and a relatively closed canopy (Aney and McClelland 1985). The feeding and nesting habitat requirements, including large snags or decayed trees for nesting and large downed wood for feeding, closely tie these woodpeckers to mature forests. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979). Modeling the above conditions using SLI data generated an estimate of pileated woodpecker habitat.

In the proposed project area, potential pileated woodpecker nesting habitat exists on approximately 21 acres near the north edge of Section 16. Younger-aged stands may provide feeding or lower quality nesting habitat. During field visits a few snags (0-2/acre) and feeding sites were observed in the state parcels.

Table 3-4 – Listed Sensitive Species for the Northwestern Land Office showing the status of these species in relation to this proposed project.

Species	Determination – Basis

Black-backed woodpecker	Dismissed – No recently (less than 5 years) burned areas are in the project area.
Boreal Owl	Dismissed – No stands above 5,200 feet are in the project area.
Coeur d'Alene Salamander	Dismissed – No moist talus or streamside talus habitat occurs in the project area.
Columbian sharp-tailed grouse	Dismissed – No suitable grassland communities occur in the project area.
Common loon	Dismissed – No suitable lakes occur within the project area.
Ferruginous hawk	Dismissed – No suitable grassland communities occur in the project area.
Fisher	Dismissed – No suitable forested riparian areas occur in the project area.
Flammulated Owl	Dismissed – No suitable dry Ponderosa pine habitats occur within the project area.
Harlequin duck	Dismissed – No suitable habitat occurs in the project area.
Mountain plover	Dismissed – No suitable grassland communities occur in the project area.
Northern Bog Lemming	Dismissed – No suitable bogs or fens occur in the project area.
Peregrine Falcon	Dismissed – No suitable cliffs/rock outcrops occur in the project area.
Pileated woodpecker	**Included** – Western larch/Douglas-fir, and limited Ponderosa pine habitats occur in the project area.
Townsend's big-eared bat	Dismissed – No caves or mine tunnels occur in the project area.

3. Big Game

a. Elk Security and Hunter Opportunity

Issue: There is concern that timber harvesting associated with this proposed project could have adverse effects on elk and other big game security and affect hunter opportunity.

Timber harvest can increase elk vulnerability by changing the size, structure, juxtaposition and accessibility of areas that provide security during hunting season (Hillis et al. 1991). As visibility and accessibility increase within forested landscapes, elk and deer have a greater probability of being observed and subsequently harvested by hunters. Because the female segments of the elk and deer harvest are normally regulated carefully, primary concerns are related to substantial reduction of the male segment and subsequent decrease in hunter opportunity. The presence of fewer males at the beginning of the hunting season reduces the odds of any given hunter to see or harvest such an animal throughout the remainder of the season.

Dense forest patches (≥ 250 acres) at least a half-mile from an open road that would provide elk (and subsequently deer) security (Hillis et al. 1991) during the general rifle

season are not present on the state parcels. This lack of habitat coupled with adjacent housing subdivisions reduces habitat quality and likely use of the state sections as security cover. Currently there is no legal, public, motorized access to the state sections, however there are roads running through the sections that connect to private roads in the area, which may introduce some hunting pressure.

b. Big Game Winter Range

Issue: There is concern that timber harvesting activities associated with this proposed project could reduce cover important for the survival of wintering elk, white-tailed deer, and mule deer.

The proposed project area provides winter habitat for white-tailed deer (*Odocoileus virginianus)*. Montana Fish, Wildlife, and Parks (DFWP) delineated winter habitat along the northeast corner of Section 16. The winter range within the project area is a part of a huge complex that extends down along Flathead Lake and goes clear up to the northern shores of Whitefish Lake. Approximately 25 acres of the 117,000-acre winter range fall within the state sections. The winter range on the state sections ranges from 3,100 to 3,500 feet in elevation, which are generally some of the lower elevations within this winter range. On average, this area receives lower amounts of snowfall than winter ranges in other portions of northwestern Montana. Proximity to housing subdivisions and other human development likely limits wintering big game use. Evidence of summer use by white-tailed deer and elk was noted throughout the proposed project area during field visits.

V. HYDROLOGY

A. Introduction

1. Water Quality

The primary parameter of concern for water quality is sediment. Increased sediment delivery and deposition can affect physical and biological water quality, channel stability and geomorphology. Sediment yield can be affected by a number of activities. Timber harvesting and associated road construction can increase sediment yield through exposure of bare soil. These impacts can be mitigated through implementation of Best Management Practices (BMPs), and other erosion control measures.

2. Water Yield

Timber harvesting and associated activities can affect the timing, distribution, and amount of water yield in a harvested watershed. Similarly, effects of stand replacement wildfire also affect water quantity and yield in a watershed. Water yields increase proportionately to the percentage of canopy removal, because removal of live trees reduces the amount of water transpired, leaving more water available for soil saturation and runoff. Canopy removal also decreases interception of rain and snow and alters snowpack distribution and snowmelt, which lead to further water yield increases. Higher water yields may lead to increases in peak flows and peak-flow duration, which can result in accelerated streambank erosion and sediment deposition.

B. Analysis Methods

Existing conditions for water quality and water yield were analyzed using field site visits and visual inspection of the drainage features in the proposed project area.

C. Analysis Area

1. Water Quality

The analysis area for water quality is the proposed project area, and all forest roads that lead into the project area from other ownership. The primary focus of the sediment delivery analysis was on the first order discontinuous draws located within the proposed project area.

2. Water Yield

The analysis area for water yield is the ephemeral draws covered by the project area.

D. Existing Conditions

1. Regulatory Framework

Montana Surface Water Quality Standards: According to ARM 17.30.608 (2), the Flathead Lake drainage and its tributaries are all classified as A-1. Among other criteria for A-1 waters, no increases are allowed above naturally occurring levels of sediment or turbidity. "Naturally occurring," as defined by ARM 17.30.602 (17), includes conditions or materials present during runoff from developed land where all reasonable land, soil and water conservation practices (commonly called BMPs) have been applied. Reasonable practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. These practices include but are not limited to structural and non-structural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that may impact the resource.

There are no designated beneficial surface water uses within the project area due to a lack of stream channels or delivery to downstream waters

Water Quality Limited Waterbodies: No portion of the proposed project area is listed in the 1996 or 2000 List of Waterbodies in Need of Total Maximum Daily Load (TMDL) Development publication produced by the Montana Department of Environmental Quality (DEQ, 1996, 2000).

Montana Streamside Management Zone (SMZ) Law: By the definition in ARM 36.11.312, no portion of the proposed project area is classified as a stream.

2. Water Quality

The existing road system in the proposed project area is low standard, and does not currently meet best management practices for surface drainage or erosion control. Some portions of the road system are poorly located in draw bottoms, or on grades over 8%. These conditions have created some erosion problems. No other sources of erosion or deposition were identified through field review. None of the ephemeral draws in the project area has a defined stream

channel, so no sediment has been delivered to a stream.

3. **Water Yield**
Past activities in and around the proposed project area include timber management, agriculture, and home site development. These activities have led to reductions in forest canopy cover, and construction of roads.

Following field reconnaissance of the proposed project area, it was determined that a detailed water yield analysis would not be necessary for the proposed project area. None of the broad ephemeral draws within the proposed project area have any evidence of overland flow (channel scour, re-alignment of litter, definable banks). In addition, areas below the project area have no current or historic drainage features. As a result, water yield increases resulting from past activities have not been sufficient to create overland flow, much less a defined stream channel or increased erosion.

VI. AIR QUALITY

This area is currently managed under the Montana Airshed Group and lies within the impact zone for Kalispell in Zone 1. The Airshed Group monitors weather conditions and manages open burning restrictions in the airshed to prevent or limit burning operations during poor dispersion and ventilation conditions. Overall air quality in this area is good with temporary periods of lower quality air during the spring and fall open burning seasons.

VII. TRANSPORTATION PLANNING/ ROAD MANAGEMENT

A. Introduction

The State Forest Land Management Plan directs DNRC to plan a road system for the minimum number of road miles and build only those roads necessary for current or near term management objectives, as consistent with the other resource management standards (ROD pg. 18). The transportation system was reviewed during the initial scoping phase of the project and evaluated the relationship of access routes and road systems regardless of ownership.

B. Access

The SFLMP directs DNRC to plan a transportation system that uses a minimum number of road miles, looks at access routes and road systems and addresses future management needs of the entire area. The White's Basin project area road system was reviewed in this manner and a transportation plan was developed. The overall objective was to develop a transportation plan that accessed the entire project area and that gave the DNRC the best possible option to obtain permanent, legal access.

The surrounding numerous, small private lands located to the north, south, and east presented a

problem with obtaining rights-of-way. Dealing with numerous, small landowners is time consuming and can be very expensive. Use of many of the existing roads was not feasible. The majority of the existing road system is located in draw bottoms and on grades that pose maintenance and erosion problems. The resulting plan would close and abandon approximately 3.5 miles of existing roads and build roads in better locations that would be more easily maintained. Rights-of-way from two private landowners and the U.S. Forest Service, Flathead National Forest would be needed and is being pursued in conjunction with this project.

C. Cumulative Effects

The lack of transportation planning and road management has led to increases in the miles of road within the project area and increased impacts. In the future, it is only going to become more difficult to obtain legal access to the project area. The surrounding lands are becoming more fragmented and developed. The impacts from lack of road management have led to noxious weed establishment and spread, lack of secure wildlife habitat, increased loss of timber due to trespass, and increased soil impacts from erosion, displacement and compaction.

CHAPTER 4 - ENVIRONMENTAL EFFECTS

I. INTRODUCTION

This chapter is the scientific and analytical basis for evaluating the environmental consequences of implementing the action or no action alternatives described and compared in chapter 2.

II. VEGETATION EFFECTS

A. Landscape Effects

1. Cover Type Distribution

Kalispell Unit: On the Kalispell Unit, the shift in current cover types when compared to "desired future" or appropriate cover types shows a decrease in western larch/ Douglas-fir cover types and an increase in mixed conifer cover types. The reasons for this trend revolve around past management and fire suppression.

No Action Alternative: The shift of the western larch/Douglas-fir cover types to 'other' cover types would continue to occur without natural disturbances (insect/disease, wildfires, etc.). No harvest treatments to open the canopy and allow for seral tree species regeneration and decrease shade tolerant composition would occur.

Action Alternative: There would be no change in the amount of acres in appropriate

cover types on the Kalispell Unit. Implementation of the action alternative would help slow the current trend of cover types shifting to shade tolerant species by favoring the retention of overstory seral tree species (western larch and ponderosa pine) which are under represented. Shade tolerant composition would be reduced and seral regeneration favored in openings.

Cumulative Effects

There would be no change in the amount or distribution of current cover types. The Kalispell Unit would still be deficit in western larch/Douglas-fir cover type. Implementation of the action alternative would help slow the invasion of the shade tolerant species into the ponderosa pine and western larch/Douglas-fir cover types and promote the regeneration of seral tree species which is becoming underrepresented on the Kalispell Unit. It would help prevent any further reductions in appropriate types on the Kalispell Unit.

2. Timber Productivity

Many timber stands within the project area are growing at the lower end of their potential due to overstocked stand conditions and the presence of insects and diseases. Silvicultural treatments prescribed to increase productivity have the potential to affect other forest values.

No Action Alternative: No trees would be harvested with this alternative. In areas outside of severe dwarf mistletoe pockets, stand density is expected to increase over time. Timber productivity would decline with increased stand stocking, resulting in increased competition between trees for nutrients and water. As disease and insect activity increase, mortality will increase and cause some openings. Natural regeneration of seral species would be unlikely without disturbances to prepare the proper seedbed for seral tree regeneration.

Action Alternative: Trees would be harvested on 996 acres of the project area from 6 different harvest units. Silvicultural treatments under this alternative would thin the overstory to reduce overcrowding, improve forest health, promote resistance of the overstory to dwarf mistletoe and promote regeneration of seral tree species such as ponderosa pine and western larch. The reduced stocking and promotion of trees less susceptible to insect and diseases would result in improved tree vigor and growth production by reducing the competition for moisture, nutrients and growing space.

Cumulative Effects

No Action Alternative: Timber productivity within the project area would continue to decline over time without a disturbance to open the canopy and reduce stand stocking and species composition. Most of the openings caused by insect and disease would regenerate with Douglas-fir due to its reproductive success and shade tolerance. The stand composition would continue to be dominated by Douglas-fir. Further reductions in the percentage of western larch or ponderosa pine as a result of mortality could result in the current western larch/Douglas-fir cover type shifting to Douglas-fir cover type.

Action Alternative: Timber productivity within the project area would generally improve over the 996 acres that would have timber harvested under this alternative. Silvicultural prescriptions would reduce stocking levels to provide more light and nutrients to remaining trees, retain the healthiest trees in the stand and retain species that are less susceptible to dwarf mistletoe and bark beetle attacks. The reduced stocking and favoring of species less susceptible to disease will ensure increased growth and vigor and improve long term timber productivity in these areas.

B. Effects to Old Growth

Kalispell Unit

There would be no direct change to the amount of old growth on the Kalispell Unit with implementation of either the action or no action alternative. There is no old growth located within the project area.

White's Basin Project Area

No Action Alternative: There would be no direct change to the amount of old growth within the White's Basin project area with implementation of the no action alternative.

Action Alternative: There would be no change to the amount of old growth within the

Cumulative Effects

No Action Alternative: There would be no effects within the project area to old growth with implementation of the no action alternative. Plant succession changes over time may change the current cover type in old growth stands in the absence of disturbance (man caused or by nature). In the ponderosa pine and western larch/Douglas-fir cover types, the development of old growth and related attributes would be reduced over the long term with the implementation of the no action alternative. This would be due, in part, to the current increases in shade tolerant species and their associated insect and disease problems and from reduced growth and vigor from overstocked stand conditions reducing the potential development of large diameter trees.

Action Alternative: There would be no short term effects to old growth with the implementation of the action alternative. The proposed commercial thinning, shelterwood-group select prescriptions under the action alternative, would help the development of old growth related attributes by reducing overstocked stand conditions and reducing the encroachment of shade tolerant species in the western larch-Douglas-fir and ponderosa pine cover types. The reduction in stand stocking would increase growth and vigor in these stands and increase the development of larger diameter trees. The increases in growth and vigor from reductions in stand stocking would also have a positive effect in the ponderosa pine types by increasing their resistance to bark beetle attack.

C. Insect & Disease Effects

No Action Alternative:

1. **Bark Beetles:** Bark beetles would continue to be present at endemic levels for the short term. As competition for nutrients increase and tree vigor declines, Douglas-fir and ponderosa pine become more susceptible to bark beetle attack. The risk of beetle populations reaching epidemic levels increases over the long term.

2. **Dwarf Mistletoe:** Dwarf mistletoe would continue to be persistent without disturbances to eliminate all or some currently infected trees. The infection would continue to be spread from infected overstory to adjacent overstory and understory trees. Reduced growth rates and tree vigor would persist as infection is spread from the overstory to younger regeneration below, resulting in long term merchantable timber quantity and quality reductions. Trees would be more likely to be infected with bark beetles.

Cumulative Effects of No Action: With implementation of the no action alternative, insect and disease populations would remain static or increase over time. Bark beetles would increase in the short term with increased stand stocking but more than likely decrease over a long period of time without disturbances (natural or man caused) to retain and promote seral species. Dwarf mistletoe would increase slowly over-time due to existing trees infecting the younger understory and may increase more dramatically as the percentage of Douglas-fir continues to increase in composition.

Action Alternative:

1. **Bark Beetles**: Douglas-fir trees currently infested with bark beetles would be salvaged. Salvaging trees recently infested with beetles can interrupt the beetles breeding cycle and result in reduced tree mortality provided the bark beetle infested tree is removed prior to the emergence of the beetle. Under the action alternative, basal area reductions resulting from thinning would increase tree growth and vigor and improve the tree's ability to "pitch out" attacking beetles and survive an attack.

2. **Dwarf mistletoe**: The action alternative would decrease the severity and spread of dwarf mistletoe. By removing infected trees, dwarf mistletoe would not be able to spread into healthy trees. Promoting seral regeneration would prevent understory from becoming infected. Western larch and ponderosa pine cannot be infected by dwarf mistletoe from Douglas-fir.

Cumulative Effects of the Action Alternative: With implementation of the action alternative, insect and disease levels would remain static or decrease over time. Silvicultural prescriptions favoring retention of species less susceptible to dwarf mistletoe would increase timber productivity. Reduced stocking levels would increase growth and

vigor in the remaining trees increasing their resistance to bark beetle attacks.

D. Noxious Weeds Effects

No Action Alternative: Current weed populations would continue to increase over time without treatment. Motorized vehicle use (the main cause in weed seed dispersal) would continue to spread weed seed along all open roads in the project area. With the adoption of the SFLMP and the cooperative agreement with the Flathead County District Weed Board, a more aggressive approach to identification and treatment of noxious weed infestations would occur than in the past. This ongoing treatment of noxious weeds should mitigate any increase in noxious weed spread and may reduce the number of acres infested in the future.

Action Alternative: The action alternative includes new construction of 8.7 miles, 3.5 miles of existing road to be closed and abandoned, and 7.2 miles of reconstruction and improvements on existing roads. All of the existing roads are currently infected with noxious weeds. Logging operations such as skidding logs, log landings, and log-hauling operations increase the exposure of bare mineral soil. The increase in bare mineral soil from road reconstruction and logging operations would increase the area where noxious weeds can become established. Mitigation measures to reduce the current weed population and restrict future infestation would include washing of heavy equipment before entering the project area and grass seeding of areas disturbed during road reconstruction and logging operations. With the adoption of the SFLMP and the cooperative agreement with the Flathead County District Weed Board, a more aggressive approach to identification and treatment of noxious weed infestations would occur than in the past. This ongoing treatment of noxious weeds should mitigate any increase in noxious weed spread and may reduce the number of acres infested in the future.

Cumulative Effects

No Action Alternative: The spread of weed seed and increases in weed populations would continue to occur with implementation of the no action alternative. The current miles of open road within the project area would not change under the no action alternative and would be the likely areas to see increases in the encroachment of noxious weeds and invasions of new species. Overall increases in noxious weed populations within the project area would most likely be short term and would decrease over time as the cooperation and joint control efforts of DNRC and Flathead County District Weed Board continues.

Action Alternative: The spread of weed seed and increases in weed populations would continue to occur with implementation of the action alternative. Road reconstruction activities that would disturb the soil create conditions that would be conducive to possible new infestations or spread of current populations. Access on existing roads within the project area is not controlled. The action alternative would control access on roads within the project area as well as close and abandon 3.5 miles of existing roads. This

would reduce the amount of acres that are traveled by motorized vehicles, which are the main cause of new infestations and spread of existing populations in the project area. Any increases in weed populations would be short term and would decrease over time as the cooperation and joint control efforts of DNRC and Lake County District Weed Board continues.

III. SOIL EFFECTS

Effects of the No Action Alternative: No timber harvesting and associated activities would take place. Effects from skid trails, landings, hazard reduction and site preparation would not occur under the no action alternative. Access to existing roads would remain uncontrolled. Existing roads with inadequate drainage would continue to erode without maintenance to improve drainage. Sedimentation is a soil-related impact that is covered in the watershed analysis.

Effects of the Action Alternative: Timber harvesting and road reconstruction activities would occur. Road reconstruction, skidding logs, site preparation, landings, and hazard reduction has the potential of increasing soil erosion, displacement, and compaction, which can result in decreased site productivity. Mitigation measures were developed to reduce potential impacts to the soil resource.

Soil erosion may increase immediately following road reconstruction, harvest operations, and hazard reduction and site preparation activities. Soils within the project area have a moderate erosion index. The following measures will minimize the extent and degree of adverse soil impacts:

- Lopping slash in main skid trails to reduce bare soil exposure.
- Placing water bars on steeper skid trail segments to slow runoff and channel water to vegetated ground.
- Grass seed road cuts and fill slopes shortly after construction and the road prism after final blading.
- Install appropriate surface drainage features on existing roads.
- Skidding will only be allowed when soil is dry, frozen, or snow covered.
- A plan for felling, skidding and landing will be required prior to the start of operations in each logging unit.

Cumulative Effects

No Action Alternative: Since no timber harvesting and associated activities are proposed under the no action alternative, there would be no effects to future soil productivity from these activities. The ability for coarse woody debris recruitment would be limited in the future due to existing open roads that provide access throughout the project area. The continued unlimited access would lead to a reduction of available snags within the project area and subsequent loss to future coarse woody debris recruitment these snags would represent. Existing roads located in bad locations and draw bottoms would continue to cause the most impacts to soil resources.

Action Alternative: The timber harvesting and related activities coupled with the road reconstruction proposed with the action alternative have the potential to cause erosion, displacement, and compaction of forest soils resulting in loss of productivity. Cumulative effects to soil productivity would be reduced with implementation of the mitigations listed above in addition to would be better to state BMP to be applied – trail spacing, location.... Coarse woody debris would be increased over most of the 996 acres proposed for timber harvest but would be limited in certain areas due to the increased fire hazard the logging slash would pose. The identified high hazard areas that would not have an increase in amount of coarse woody debris would occur along property boundaries and open roads. The action alternative would increase the recruitment of coarse woody debris over the long term through road closures aimed at decreasing access into and through the project area. 3.5 miles of existing roads that are located in draw bottoms and in poor locations would be closed and abandoned.

IV. WILDLIFE EFFECTS

A. Coarse Filter

1. Direct and Indirect Effects

No-Action Alternative

Forest conditions would continue to move toward denser stands of Douglas-fir with high canopy cover. Compared to perceived historical conditions, this change in stand structure, composition, and dominant disturbance regime has resulted in larger patch sizes, fewer small openings, and less edge habitat. No immediate changes are anticipated in patch size, shape or connectivity. Over time, western larch in the proposed units would die, and dense shade-tolerant species in the midstory would prevent their replacement. A stagnated, dense stand of Douglas-fir would likely result. Wildlife favoring dense stands of Douglas-fir would benefit, while those requiring open, mature western larch/Douglas-fir stands likely found under natural disturbance regimes would continue to be underrepresented. Potential habitat for old stand-associated species like American marten, northern goshawk, and pileated woodpeckers would continue developing over time.

Action Alternative

Approximately 996 acres of forest canopy would be partially opened up. Additionally, shade-intolerant western larch would be retained, while much of the shade-tolerant

Douglas-fir would be removed. These conditions would lead to more open stands of mature western larch and Douglas-fir. Regeneration of shade-intolerant western larch is expected based upon silvicultural prescriptions. The proposed prescriptions would have negligible changes to edge habitats, because harvests would thin, but not eliminate forest cover; immediate reductions in edge habitat may be caused by logging disturbance, but short-term replacement is anticipated. Likewise, negligible changes to patch size, shape, and landscape connectivity are expected. The resulting stand structure and composition, being more open than the current stands and dominated by western larch and Douglas-fir, would be more sustainable while being less susceptible to stand replacing fires. These conditions would favor species requiring more open habitats as likely existed under natural disturbance regimes, while negatively impacting those species that use denser stands of multi-layered forests. Potential habitat for old stand-associated species like American marten, northern goshawk, and pileated woodpeckers would be reduced in the short-term, however the retention of mature trees is expected to expedite the development of a multi-layered canopy, which would benefit these species in the long-term.

2. Cumulative Effects

No-Action Alternative

Under this alternative, the existing habitats within the proposed project area would continue to provide habitat for wildlife requiring denser stands with a closed canopy. Surrounding stands are a mosaic of age classes, representing young stands that have been recently harvested to mature stands. Subdivision and associated development on parcels to the north and south of the larger, main state parcel along with recent harvesting on partial sections to the east and west of this same parcel have removed forested habitats, fragmented existing forested patches, and removed a portion of the landscape connectivity within this area. Edge habitats between these earlier harvested stands and the state parcel exist. Actions under this alternative would cause neither changes in patch size nor configuration.

Action Alternative

Under this alternative, stands would be opened up, increasing tree spacing while decreasing canopy closure. Proposed harvest units would blend with several recent harvest units on adjacent parcels (particularly to the east and west of the state section), increasing patch size. Habitat quality for wildlife species that benefit from the dense stands of Douglas-fir would decrease, while those species that require more open stands of western larch and Douglas-fir would benefit. Sustainability of this larger stand of western larch/Douglas-fir in the future is improved. Again, landscape connectivity has been compromised with recent harvests and housing subdivisions, and no further reduction in landscape connectivity is expected to occur.

B. Fine Filter

1. Threatened and endangered species

No direct, indirect, or cumulative effects identified for any of the Threatened and endangered species (see Chapter 3).

2. Sensitive species

a. Pileated Woodpecker

1. Direct and Indirect Effects

No-Action Alternative

No direct impacts are anticipated under the No Action Alternative. Remaining shade-intolerant trees would continue to grow and die over time, providing nesting and foraging habitat. As these trees die, replacement shade-intolerant trees would not be present in the stand unless other disturbance influences the stands, allowing for their regeneration. Therefore, a reduction in suitable nesting trees is likely over time. Pileated woodpeckers typically do not nest in Douglas-fir; however they will forage on the boles of Douglas-fir. Under the No Action Alternative, stands once dominated by western larch would continue to be converted to Douglas-fir stands through succession, become densely stocked, and exist at high risk to insects, disease and stand-replacement fire. Thus, habitat sustainability and quality for pileated woodpeckers would then decline over time.

Action Alternative

Pileated woodpeckers tend to be tolerant of human activities (Bull and Jackson 1995), but might be temporarily displaced by proposed harvesting and road building. Elements of forest structure important for nesting pileated woodpeckers would be retained, including snags, coarse woody debris, and shade-intolerant trees. On the 21 acres of pileated woodpecker nesting habitat on the state parcel, approximately half of the volume would be removed, which would be comprised mostly of Douglas-fir from the midstory and overstory. This might reduce pileated nesting use in this limited area, while removing foraging substrates. After the proposed harvest, 996 acres of more open and mature stands of western larch, ponderosa pine, and Douglas-fir would probably be too open to be considered preferred pileated habitat. However, as a more uneven-aged stand develops quality of foraging and nesting habitats for pileated woodpeckers are expected to improve over the next several decades. This more open stand should also lead to the recruitment of new, shade-intolerant western larch that could benefit pileated woodpeckers in the future by providing nesting, roosting, and foraging substrates. Short-term habitat suitability would be reduced while the stand is more open, but long-term use is more probable given the silvicultural prescriptions improving habitat sustainability through time.

2. Cumulative Effects

No-Action Alternative

Under the No Action Alternative, forests on the state parcel would continue to grow and die over time, providing nesting and foraging habitats. Through time, conversion of stands to Douglas-fir would reduce nesting substrates for pileated woodpeckers. Forests on adjacent USFS parcels would also likely continue along this path of aging and cover type conversion. Subdivisions to the north and south of the proposed project area have eliminated much of pileated woodpecker habitats within these sections. Recent harvesting on adjacent parcels within the analysis area has removed many of the larger trees and opened up the stands, reducing habitat quality for pileated woodpeckers. Individual trees left in some of the harvest units could provide nesting substrates in the future (40+ years), however the encroachment of subdivisions and associated development likely limits future use of these areas. The proposed project area in conjunction with forested habitats on the USFS parcels and private ownerships might provide adequate nesting and foraging habitats for a pair of pileated woodpeckers.

Action Alternative

Under the Action Alternative, reductions in pileated woodpecker habitat are expected. Existing snags, coarse woody debris, and suitable nesting trees would be retained within the proposed project area; however, the canopy on the state sections would likely be too open for appreciable pileated woodpecker use. These habitats would blend with the previously opened up stands on adjacent private parcels. After the proposed harvest, the analysis area would likely be insufficient to support a pair of pileated woodpeckers. In the future (40+ years), the forest on the state parcels should provide suitable habitat for pileated woodpeckers in the general vicinity. However, with the encroaching subdivisions and development in the analysis area it is unlikely that the analysis area would be capable of supporting a pair of pileated woodpeckers, but could serve as important habitat for woodpeckers using the adjacent USFS parcels.

3. Big Game

a. Elk Security and Hunter Opportunity

1. Direct and Indirect Effects

No-Action Alternative

No changes in elk security cover are expected. Despite no legal, public, motorized access to the sections, use is evident and expected to continue along existing roads/trails, which would eliminate elk security in the future. Timber stands would continue advancing to climax plant species. No alterations in cover would occur that

would increase elk vulnerability during the elk hunting season.

Action Alternative

As regeneration advances in the understory, hiding cover would improve, however, security cover would still be absent from the state parcels. No changes to public access are expected, so changes in hunting pressure are unlikely. Limited habitat and close proximity to housing developments would likely reduce elk use of the area during the general elk hunting season.

2. Cumulative Effects

No-Action Alternative

Over time habitats on the state parcel would become denser, offering greater hiding cover, benefiting deer and elk using the state sections during the hunting season. No improvement in elk security is anticipated since no changes in access are expected. High road densities and considerable harvest in the analysis area would continue to prevent elk use of the area for security cover. Subdivisions on adjacent parcels have also reduced elk security within the analysis area. Future harvest and development that could occur across other ownerships within the analysis area would not be expected to improve elk security. Recently harvested stands on adjacent parcels would likely provide additional hiding cover in 20-40 years if they remain relatively undisturbed and undeveloped.

Action Alternative

Negligible changes to big game survival are anticipated. No changes in elk security are anticipated. A reduction in hiding cover caused by the proposed harvest would be additive to the harvest that has occurred in the past on adjacent parcels, and that could occur in the near future on adjacent ownerships. The effects of these reductions in cover are minimal because of the development and subdivision occurring within the relative vicinity, likely reducing elk use and subsequently hunter use of the area.

b. Big Game Winter Range

1. Direct and Indirect Effects

No-Action Alternative

Under this alternative, big game thermal cover in the state parcel would not be altered over the short-term. Existing stands would continue to provide thermal cover for big game. In the long-term, continued succession would improve thermal cover while decreasing forage production. Levels of human disturbance within the state parcels would remain relatively constant, including disturbance within the winter range, which

could stress big game using the area.

Action Alternative

No direct displacement of wintering big game is expected to result from the proposed harvesting operations. Shifts in habitat use within the winter range are expected if this area is used by big game. Thermal cover within the winter range would be reduced, and forage production would be increased. Canopy cover would be reduced on the entire 25 acres of winter range documented by DFWP in the proposed project area. This reduction of 25 acres would have negligible effects on the larger 117,000-acre winter range. The resulting stands on the state sections would still provide some limited thermal cover and snow intercept properties along with some increased forage production potential. Since this is not a heavy snow area, the importance of snow intercept and thermal cover in years of normal snowfall is reduced. However, during more severe winters, the importance of snow intercept and thermal cover is much greater to the survival of ungulates using these areas. Proposed timber harvests would not prevent big game movement through the area.

2. Cumulative Effects

No-Action Alternative

No changes are anticipated in thermal cover and snow intercept. DFWP identified 1,650 acres of potential winter range within the analysis area. Considerable harvesting and subdivision on adjacent parcels has reduced thermal cover and snow intercept in the analysis area. The thermal cover on the state section may be providing winter habitat for big game, however the recent harvesting and housing development on the adjacent parcels have bisected the winter range.

Action Alternative

Within the 1,650 acres of thermal cover identified within the cumulative effects analysis area, thermal cover would largely be removed from the 25 acres (1.5% of the winter range in the analysis area) within the state sections. The proposed reduction in thermal cover would be additive to the reductions in thermal cover and snow intercept from the recent harvesting and high levels of human development and subdivision on adjacent parcels. Although the proposed harvesting would affect 1.5% of the winter range in the analysis area, the long-term effects are expected to be greater, since the larger winter range would be further bisected, as the loss of thermal cover on the state section is adjacent to a portion of the winter range that has been harvested and is being developed as a housing subdivision. Since winter ranges tend to concentrate big game from a much larger area during the winter, these winter ranges are vital to big game survival. Should cover important for winter survival of big game be reduced below a minimum threshold over time across all ownerships, a reduction in winter carrying capacity, and subsequent reduction in big game numbers could occur.

V. HYDROLOGY EFFECTS

Effects of the No Action Alternative: Direct and indirect effects of the No Action alternative would be similar to the conditions described under the existing conditions for water quality and water yield. The water quality and water yield would be unaffected by the no action alternative, and the ephemeral draws in the proposed project area would continue to be affected by natural and pre-existing conditions.

Effects of the Action Alternative: The proposed action alternative would harvest timber from approximately 996 acres. No measurable impacts to water yield are anticipated from the proposed harvesting for the following reasons: 1) The selective nature of the harvest over most of the proposed project area would leave substantial amounts of live trees on the site, and is designed to allow more rapid growth, 2) The well-drained to excessively well-drained nature of the soils would produce little or no detectable change in water yield, 3) The ephemeral draws within the project area are stable and vegetated with a dense mat of grass and forb vegetation, making them capable of handling potential water yield increases without destabilizing.

The action alternative would also improve the erosion control and surface drainage on 7.2 miles of existing road, providing a more easily maintained road system. In addition, 8.7 miles of new road would be constructed to access the proposed harvest units. All new road construction would install adequate surface drainage for controlling erosion. Approximately 3.5 miles of existing low standard road within the project area that is currently located in draw bottoms or on steep grades would be abandoned. Abandoned roads would have erosion control installed and be left in a condition where future maintenance would not be needed.

Cumulative Effects

Effects of the No Action Alternative: Cumulative effects of the No Action alternative on water quality and water yield would be similar to the situations described in the existing conditions. The water quality, water yield and fish populations would be unaffected by the No Action alternative, and the ephemeral draws in the proposed project area would continue to be affected by natural and pre-existing conditions.

Effects of the Action Alternative: Risk of sediment delivery in the proposed project area would be reduced from current levels. Decommissioning of existing poorly located roads would reduce erosion rates and lower the risk of sediment delivery to other areas. Similarly, improvement and installation of erosion control and surface drainage on the existing road system would reduce erosion rates from current levels and reduce the risk of sediment delivery to other areas.

Past activity in and around the proposed project area has mainly consisted of grazing and agricultural use, with some areas being managed for timber production. On sites where timber was harvested, there has been substantial vegetative and hydrologic recovery with no apparent

impact on water yield increases.

The proposal is to selectively harvest the stand by commercial thinning. Watershed cumulative effects are not anticipated for the following reasons: 1) The selective nature of the harvest over most of the proposed project area would leave substantial amounts of live trees on the site, and is designed to allow more rapid growth, 2) The well-drained to excessively well-drained nature of the soils would produce little or no detectable change in water yield, 4) The ephemeral draws within the project area are stable and vegetated with a dense mat of grass and forb vegetation, making them capable of handling potential water yield increases without destabilizing, and 5) All of the proposed harvesting area is drained by ephemeral draws with no surface delivery to another body of water, therefore potential increases in sediment or water yield from harvest activities would not affect downstream waters.

VI. AIR QUALITY EFFECTS

Effects of the No Action Alternative: Under the no action alternative, air quality would not change from the existing condition. No slash burning would be done. Wildfires are possible and would temporarily reduce air quality.

Effects of the Action Alternative: All slash burning will be done in cooperation with the Montana Airshed Group. This will provide for burning when conditions are acceptable in terms of ventilation and dispersion. No slash burning will be done when inversions or other stable weather systems prevail. Dust may be created from log hauling activities on native surfaced and graveled roads. Wildfires would still be possible under the action alternative.

VII. TRANSPORTATION PLANNING/ ROAD MANAGEMENT EFFECTS

A. Access

Effects of the No Action Alternative: Under the No Action Alternative, the State would continue to pursue acquiring permanent legal access for management purposes per the management direction in the SFLMP. Reciprocal access would be used for the state to acquire permanent easements on 1.8 miles of road from two private landowners. The state in turn would grant permanent easements on 0.5 miles to industrial private, and 1.4 miles to small private. DNRC would acquire approximately 3.4 miles from USFS as part of Cost Share Agreement.

Effects of the Action Alternative: Under the Action Alternative (as with the No Action Alternative), the State would continue to pursue acquiring permanent legal access for management purposes across per the management direction in the SFLMP. A Cost Share Agreement with the U.S. Forest Service, Flathead National Forest and reciprocal access agreements with private land owners would be required to gain legal access to the project area.

B. Cumulative Effects

Effects of the No Action Alternative: Legal access would continue to be pursued for accessing the project area. It would likely take a much longer time period and therefore increase the cost of the access. Uncontrolled access to the area would continue and have negative effects on vegetation as noxious weeds would spread more rapidly and frequently. The effects to wildlife habitat security as well as the effects to the vegetation from the spread of noxious weeds would continue until funds were available to control access.

Effects of the Action Alternative: The road reconstruction standards used would result in a road system that would provide a safer road that would be maintainable in the future. Road closures would improve the long-term security of wildlife in the area and reduce the amount of spread of noxious weeds along roads. Soil impacts from erosion, displacement and compaction would be reduced on abandoned roads

VIII. ECONOMIC ANALYSIS

The economic analysis for the White's Basin project estimates the revenue from timber harvesting and non-administrative costs for the No Action and Action Alternative. The costs related to the administration of the timber sale program are only tracked at the Land Office and statewide level. DNRC does not keep track of costs for individual timber sales. These figures are only for relative comparison of the alternatives and should not be used as absolute estimates of return.

The following assumptions were made:

1. The estimated harvest volume is 5,000 MBF.

2. The estimated stumpage value is $120 per MBF.
   - The estimated stumpage value is the net amount the State would receive for volume removed. It equals the delivered log prices minus costs and an amount for profit and risk. Costs include logging costs, haul costs, forest improvement fees, development costs, and other costs (purchase of right-of-ways).

3. Development Costs for:

   a. No Action Alternative
      - Reciprocal Access/ Purchase Access (Est.): $40,000

   b. Action Alternative
      - Reciprocal Access/ Purchase Access: $35,000

   The development costs for the No Action Alternative would be funded from the

current Forest Improvement (FI) account. The development costs for the Action Alternative would be a required development cost of the purchaser and paid by the purchaser.

4. Forest Improvement (FI) cost is based on the program wide cost and cost to maintain the ongoing staffing, stand and road maintenance treatment needs for the current year and right-of-way acquisition. Money collected under FI from a purchaser provides the funding for the State to accomplish projects such as tree planting, site preparation, slash treatment, pre-commercial thinning, road maintenance, road acquisition and for some timber sale related activities. Thus, the State is able to improve the long-term productivity of timber stands on State land and maintain or acquire access for future revenue producing projects. The current FI fee for the Northwest Land Office is $7.68 per ton.

5. Limitations of the economic analysis are that 1) only known cost and benefits that are related to timber harvesting activities or other revenue producing activities are considered and that 2) none of the potential benefits associated with leaving trees (i.e. snag recruitment, structural diversity, aesthetics, wildlife habitat, nutrient recycling, etc. are considered directly in this analysis.

Table 4-2 Costs and Benefits Estimates by Alternative

	No Action		Action Alternative		
	Total $	$/ Acre*	Total $	$/MBF	$/ Acre*
Development Cost –Access Purchase	$40,000	$39.31	$35,000	$7.77	$34.40
Forest Improvement	$ 0.00	$ 0.00	$261,150	$52.23	$256.66
Estimated Total $ Revenue to the Trust from Timber (Stumpage x harvest volume)	$0.00	$0.00	$600,000	$120.00	$589.69
Estimated Timber Dollar Collected by the State (Stumpage + FI)	$0.00	$0.00	$861,150	$172.23	$846.35
Estimated Total Dollar Revenue to the Trust	$0	$0	$600,000	N/A	$589.69

***$/Acre is calculated by dividing by the Total Project Acres of 1,017.49.**

Effects of the No Action Alternative: The estimated Total Dollar Revenue to the Trust would be $0. The costs to the Forest Improvement account would total approximately $40,000 for purchasing legal easement to access the project area.

Effects of the Action Alternative: The estimated Total Dollar Revenue to the Trust would be $600,000. A cost of approximately $35,000 would be paid by the purchaser for access into the project area.

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GLOSSARY

Animal Unit Month (AUM): The number of animals times the number of months they graze. An "animal unit" is a cow with calf.

Biodiversity: The variety of life and its processes. It includes the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur. (From Keystone Center)

Closed road: A road that exists but is not open to vehicle traffic because of gates, berms, or other man-made obstructions.

Cumulative effects or impacts: The impact on the environment that results from the incremental impact on an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative effects or impacts can result from individually minor but collectively significant actions taking place over a period of time.

Endangered Species: A plant or animal species whose prospects of survival and reproduction are in immediate jeopardy. Its peril may result from one or many changes: loss of habitat or change in habitat, overexploitation, predation, competition, disease, or even unknown reasons. An endangered species must have help, or extinction may follow. It must be designated in the Federal Register by the appropriate Secretary as an "endangered species." (Schwarz et al. 1976)

Endangered Species Act (ESA): The Act that required consultation with the Fish and Wildlife Service (Interior) if practices on National Forest System lands may impact a threatened or endangered species (plant or animal). Direction is found in FSM 2670.

Forest Health: A condition for forest ecosystems that sustains their complexity while providing for human needs. In terms of ecological integrity, a healthy forest is one that maintains all of its natural functions. In relation to management objectives, forest health represents a condition which meets current and prospective future management objectives. (After O'Laughlin et al. 1993, Monnig and Byler 1992)

Habitat Type: A collection of land areas potentially capable of producing similar plant communities at climax, generally named for the predicted climax community type. (After Pfister et al. 1977)

Hydrology: A science dealing with the properties, distribution, and circulation of water, specifically the study of water on the surface of land, in the soil and underlying rocks, and in the atmosphere, with respect to evaporation and precipitation. (After Webster 1963 In: Schwarz et al. 1976)

Noxious Weed: Plants that conflict with, interfere with,or otherwise restrict land management are commonly referred to as weeds. A plant that has been clssified as a weed attains "noxious" status by an act of State legislation.

Old Growth: Stands that are older than 150 (140 for lodgepole pine) and that exhibit a range of structural attributes associated with old age.

Open road: A road that is open year-round with no restrictions.

Riparian area: Green zones associated with lakes, reservoirs, estuaries, potholes, springs, bogs, fens, wet meadows, and ephemeral, intermittent, or perennial streams. The riparian/wetland zone occurs between the upland or terrestrial zone and the aquatic or deep water zone.

Salvage **Cutting:** The removal of dead trees or trees being damaged or killed by injurious agents other than competition, to recover value that would otherwise be lost. (Silviculture Working Group 1993)

Scarification: A deliberate, moderate disturbance of soil to remove or mix surface duff with less than 1" of surface mineral soil. Scarification provides bare mineral soils for trees that need it to regenerate. It also promotes oxidation of organic matter and speeds its breakdown into nutrients to enrich soil.

Sensitive species: A U.S. Forest Service designation for plant or animal species that are vulnerable to declines in population or habitat capability which could be accelerated by land management activities.

Shelterwood: A method of regenerating an even-aged stand in which a new age class develops beneath the partially-shaded environment provided by the residual trees.

Silviculture: The art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands. Silviculture entails the manipulation of forest and woodland vegetation in stands and on landscapes to meet the diverse needs and values of landowners and society on a sustainable basis. (Silviculture Working Group 1993)

Site preparation: A hand or mechanized manipulation of a site designed to enhance the success of regeneration. Treatments may include chopping, discing, bedding, raking, burning, and scarifying. All treatments are designed to modify the soil, litter, and vegetation, and to create microclimate conditions conducive to the establishment and growth of desired species. (Silviculture Working Group 1993)

Skidding: A loosely-used term for the transportation of logs from stumps to a collecting point by sliding or dragging along the ground-- as opposed to the use of wheels, helicopters, balloons, cables, etc., to keep them totally off the ground (After Ford-Robertson 1971 In: Schwarz et al. 1976)

Slash: Branches, tops, and other debris from the cutting of trees.

Snag: A standing dead tree.

Stand: A contiguous group of trees sufficiently uniform in age class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit. (Silvicultural Working Group 1993)

Stocking: An indication of growing space occupancy relative to a pre-established standard. (Silviculture Working Group 1993)

Streamside Management Zone (SMZ): The zone around a streambank, from 50' to 300' wide, where certain management activities are limited or prohibited to minimize unfavorable impacts on aquatic and riparian environments. The Streamside Management Zone Law (77-5-301 MCA) prohibits certain forest practices along stream channels.

Threatened species: Species which are likely to become "endangered species" within the foreseeable future throughout all or a significant portion of their range are designated threatened species in the Federal Register by appropriate Department Secretaries. (Schwarz et al. 1976)

Thinning: A cutting made to reduce stand density of trees primarily to improve growth, enhance forest health, or to recover potential mortality. (Silviculture Working Group)

Trust mandate: The requirement that State trust lands be managed to provide income for schools.

Watershed: The area drained by a river or river system.

Wetlands: Areas that are permanently wet, or intermittently water covered, such as swamps, marshes, bogs, muskegs, potholes, swales, glades, and overflow land of river valleys. Large, open lakes are commonly excluded, but many kinds of ponds, pools, sloughs, holes, and bayous may be included. (Veatch and Humphrys 1966 In: Schwarz et al. 1976.

Glossary References

Keystone Center. 1991. Biological diversity on federal lands: report of a Keystone policy dialogue. Keystone, CO: The Keystone Center.

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Pfister, R.D.; B.L. Kovalchik; S.B. Arno; R.C. Presby. 1977. Forest habitat types of Montana. USDA Forest Service General Technical Report INT-34. 174p.

Schwarz, C.F.; E.C. Thor; G.H. Elsner. 1976. Wildland planning glossary. USDA Forest Service General Technical Report PSW-13. Pacific Southwest Forest and Range Experimental Station, Berkeley, CA.

Silviculture Working Group. 1993. Silviculture terminology-September 1993. Bethesda, MD: SAF Silviculture Working Group Newsletter, October 1993.

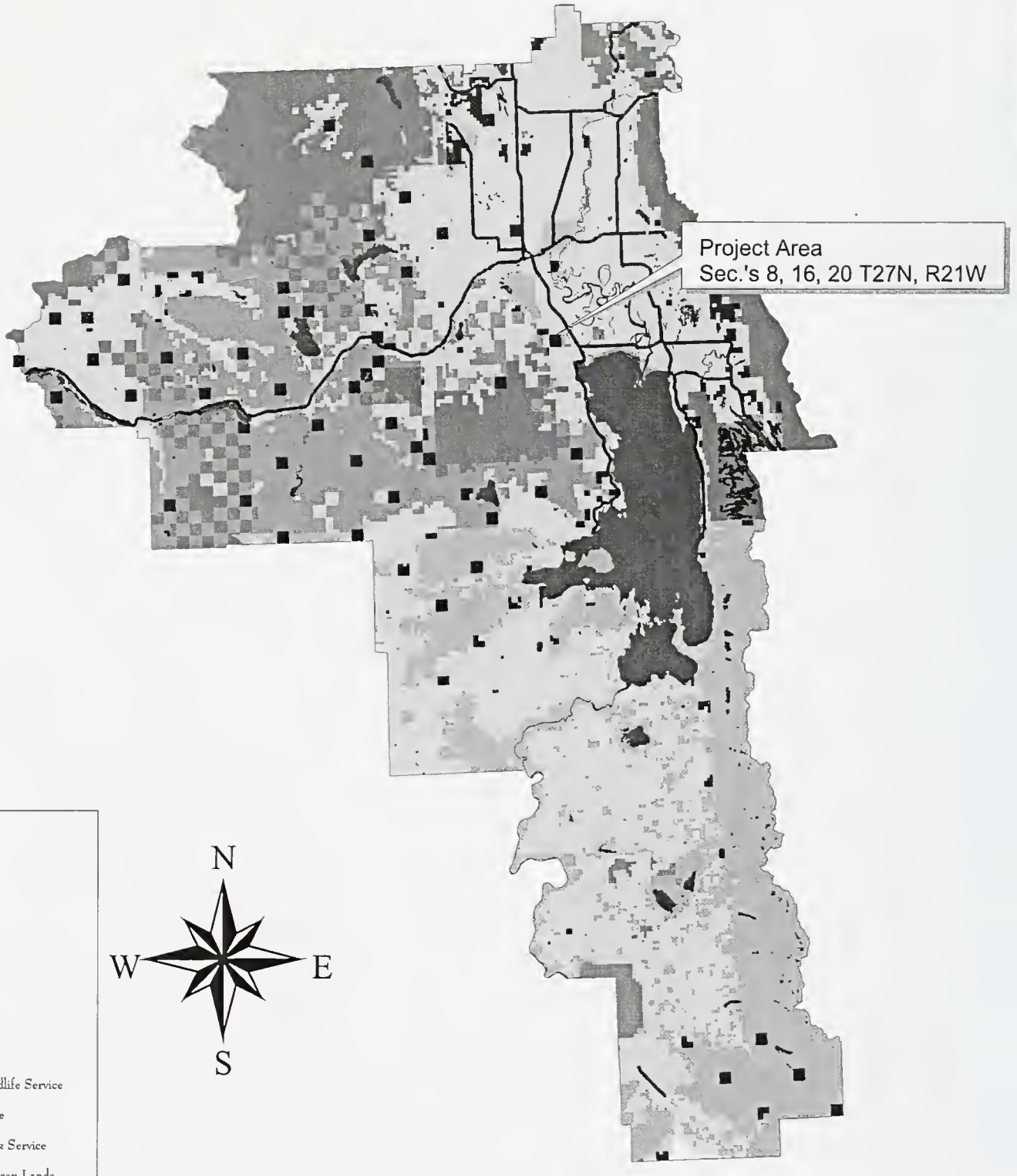
ACRONYMS

ARM	Administrative Rules of Montana
AUM	Animal Unit Month
CMP	Corrugated Metal Pipe
DBH	Tree Diameter At Breast Height
DNRC	Department of Natural Resources and Conservation
ECA	Equivalent Clearcut Acres
ESA	Endangered Species Act

MCA	Montana Codes Annotated
MBF	Thousand Board Feet
MMBF	Million Board Feet
SMZ	Streamside Management Zone
USFS	United States Forest Service
WYI	Water yield increase

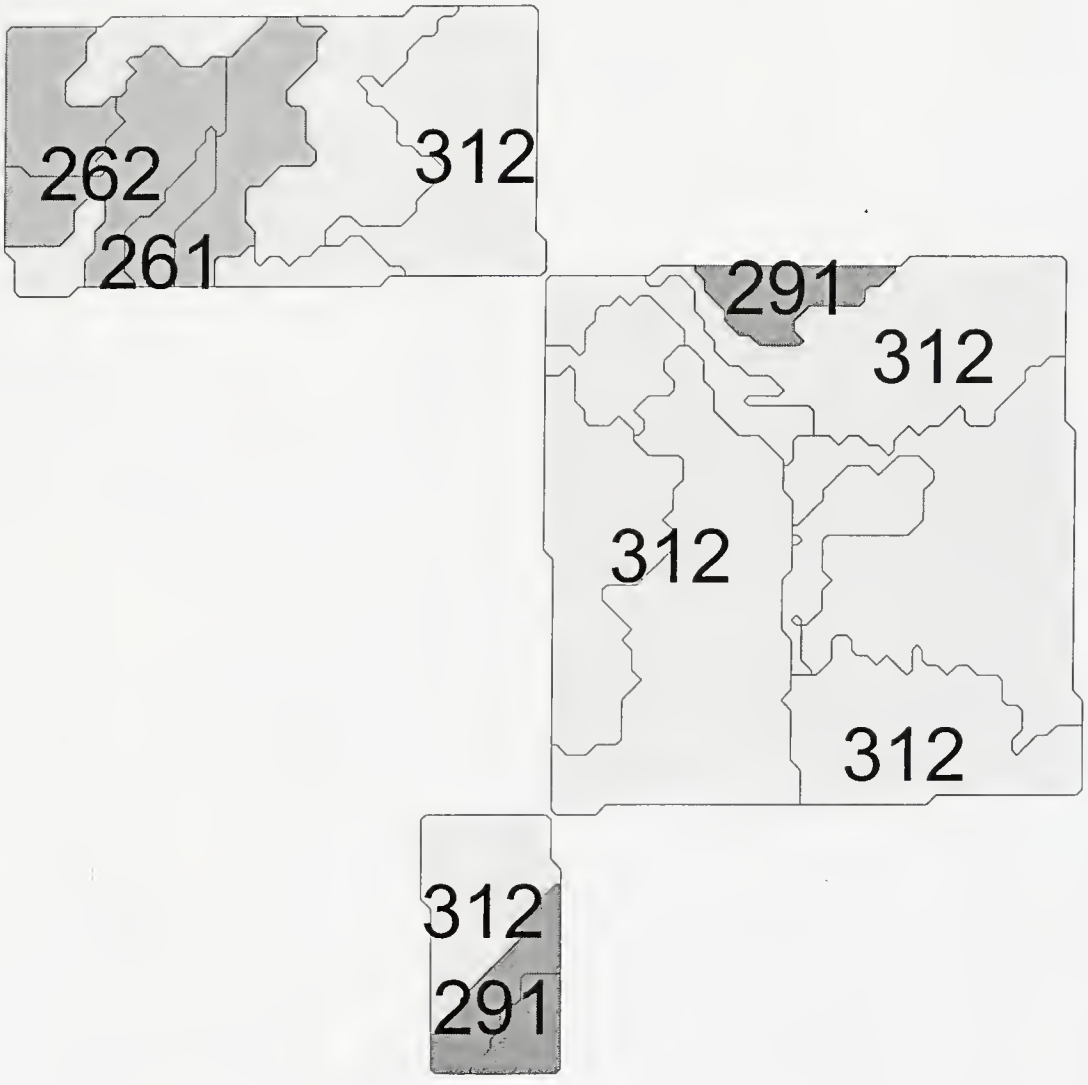
Attachment A

White's Basin Timber Sale Vicinity Map



Attachment A

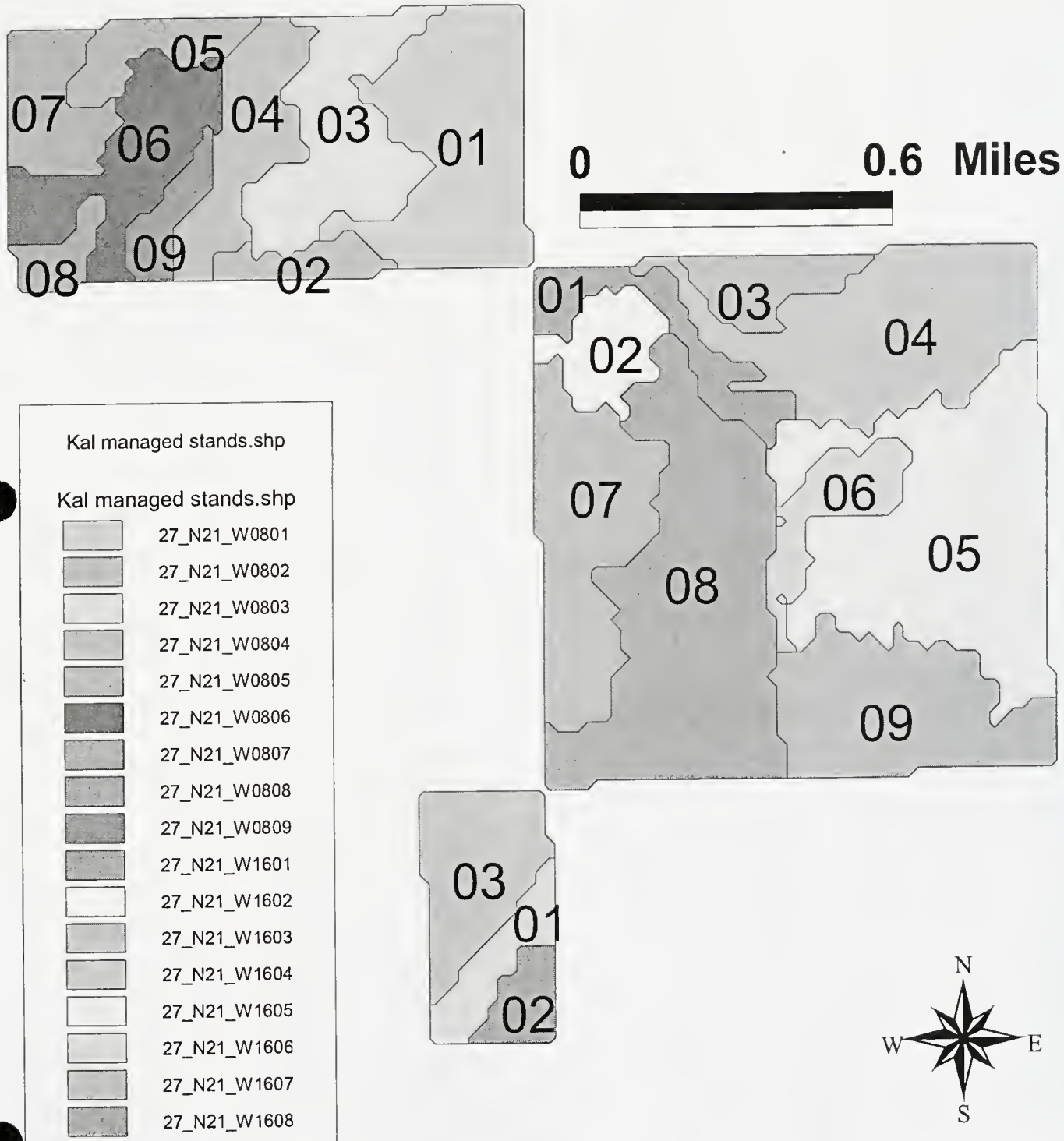
White's Basin Timber Sale
Habitat Types



Habitat Types by Stand

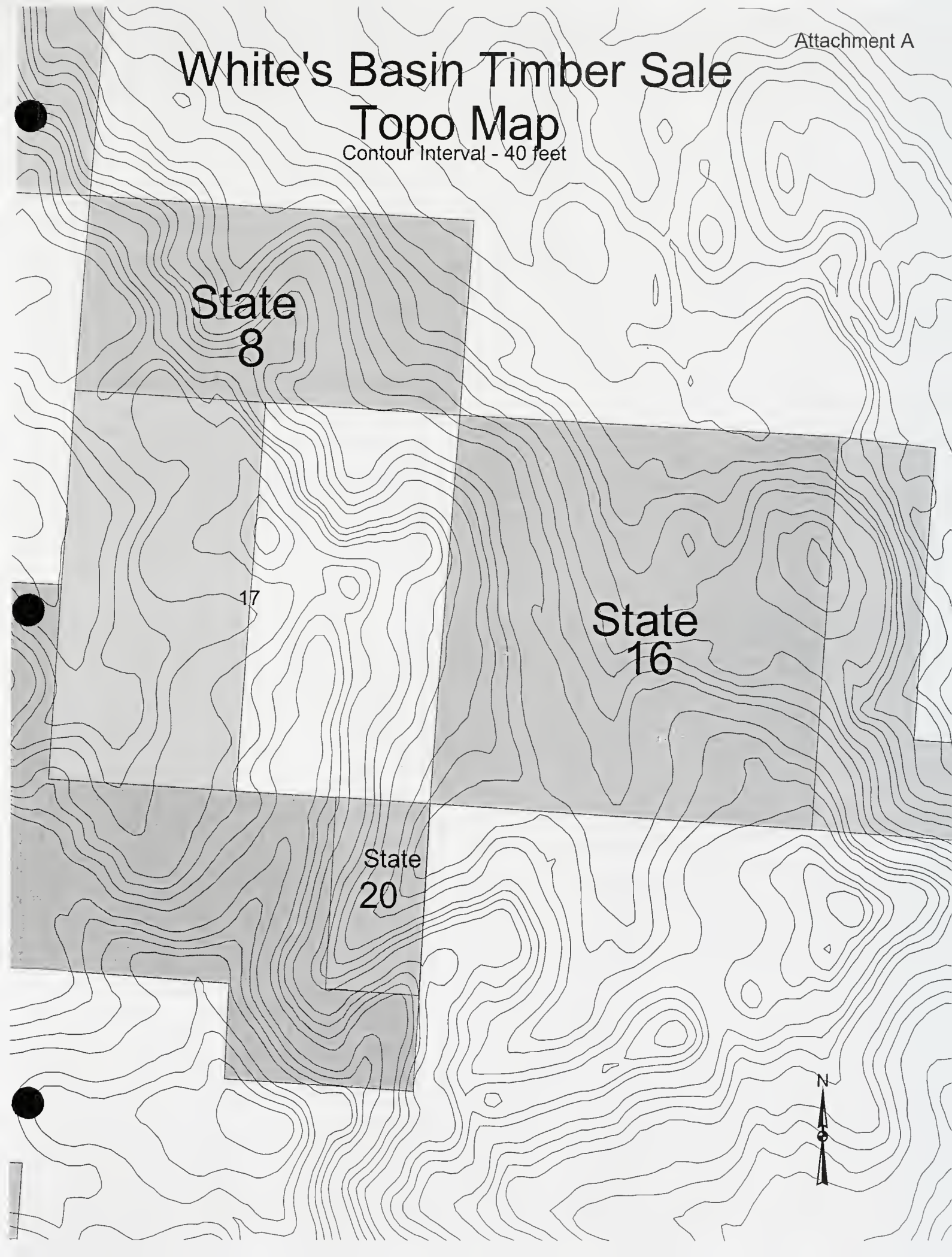
- 261 - PSME/PHMA/PHMA
- 262 - PSME/PHMA/CARU
- 291 - PSME/LIBO/SYAL
- 292 - PSME/LIBO/CARU
- 312 - PSME/SYAL/CARU

White's Basin Timber Sale
Stand ID Map



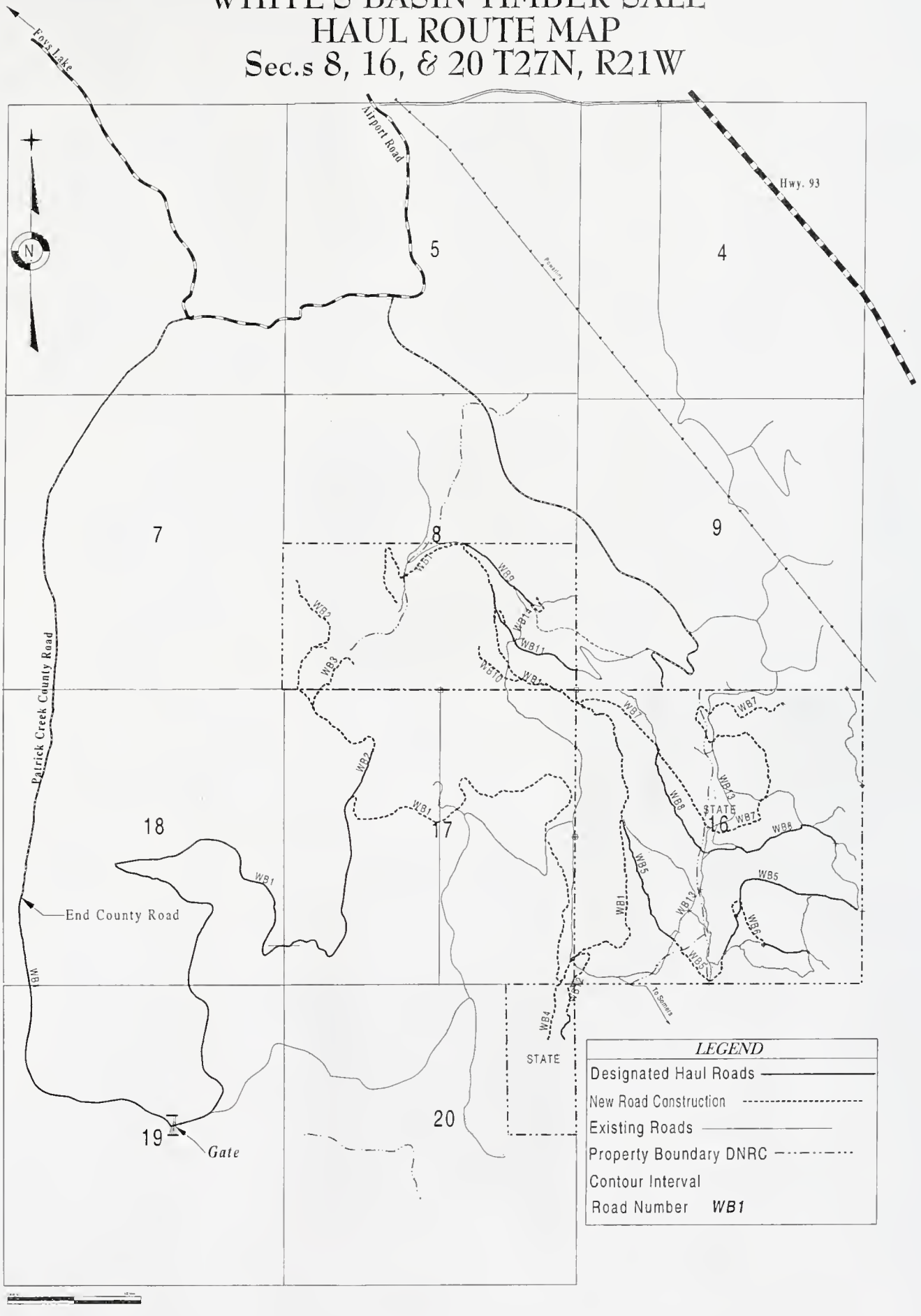
Attachment A

White's Basin Timber Sale
Topo Map
Contour Interval - 40 feet



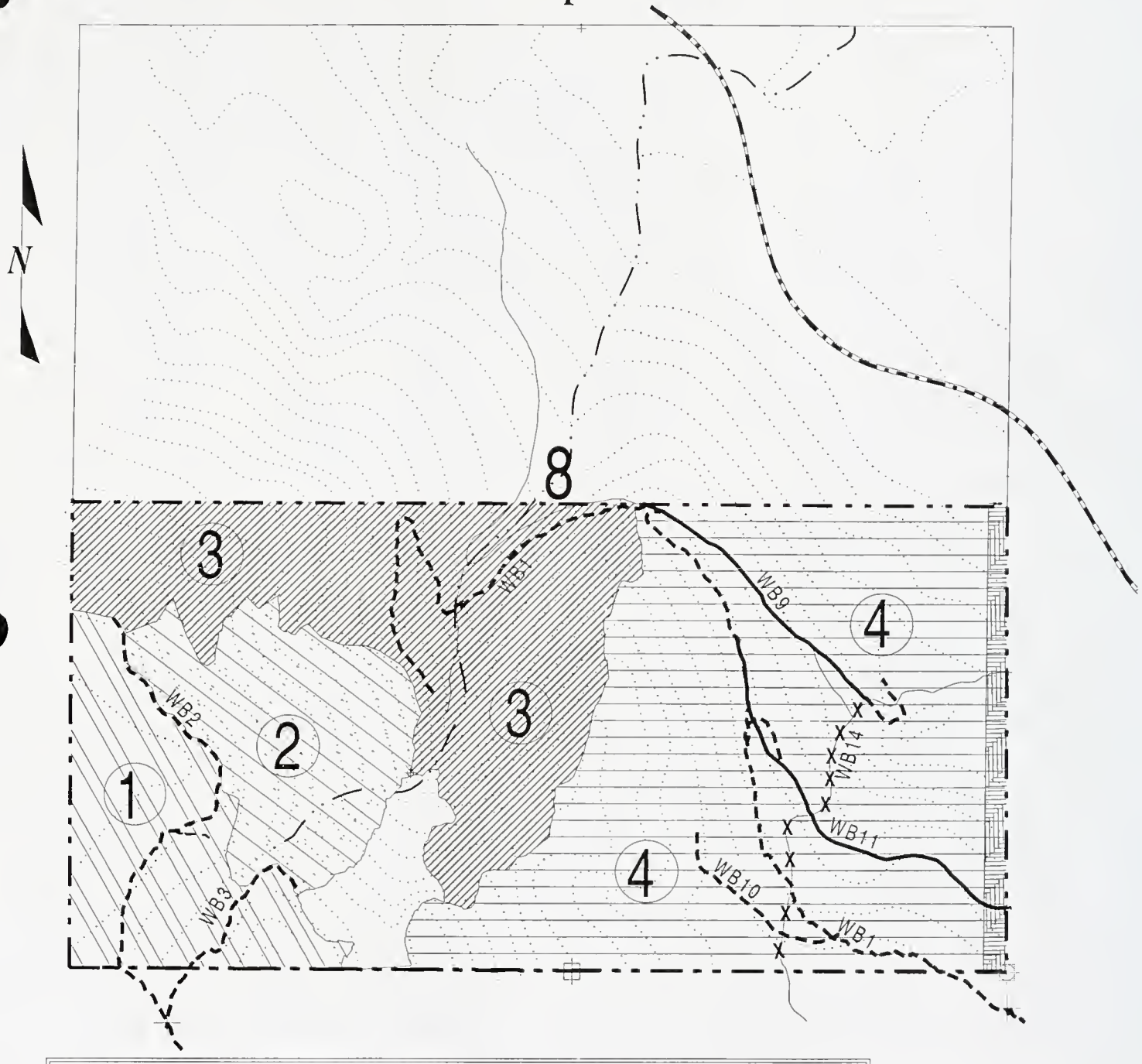
Attachment A

WHITE'S BASIN TIMBER SALE
HAUL ROUTE MAP
Sec.s 8, 16, & 20 T27N, R21W



Attachment A

WHITE'S BASIN TIMBER SALE
Sale Map - Sec. 8



LEGEND

Designated Haul Roads

New Road Construction

Existing Roads

Contour Interval

Road Segment to be Reclaimed

High Hazard Slash Reduction

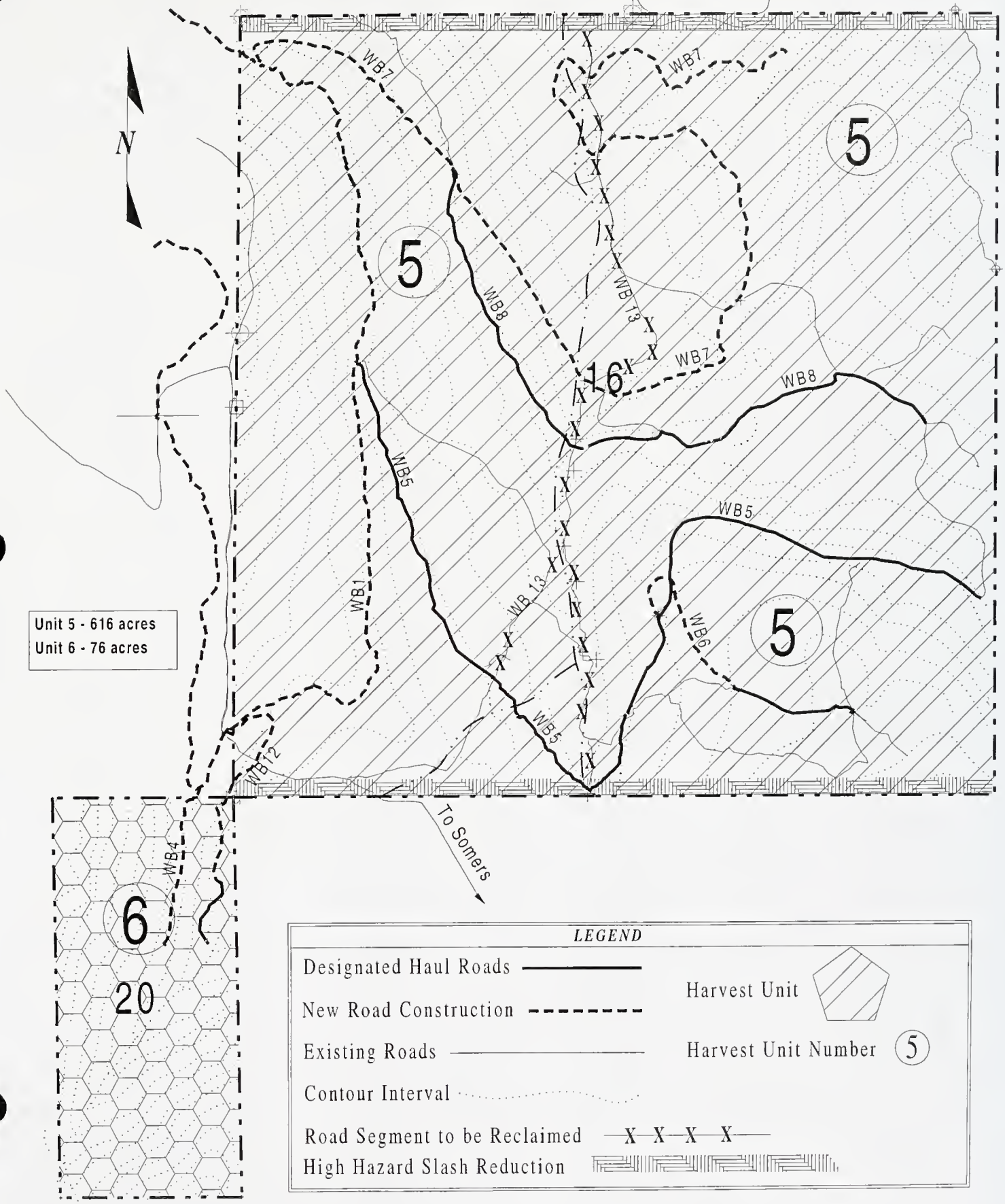
Harvest Unit

Harvest Unit Number (2)

Unit 1 - 38 acres
Unit 2 - 36 acres
Unit 3 - 79 acres
Unit 4 - 151 acres

Attachment A

WHITE'S BASIN TIMBER SALE
Sale Map - Sec. 16 & 20



FINDING

PROPOSED WHITE'S BASIN TIMBER SALE
DNRC - KALISPELL UNIT

January 24, 2003

An interdisciplinary team (ID Team) has completed the Environmental Assessment (EA) for the proposed White's Basin Timber Sale on state owned lands in Sections 8, 16, and 20, T27N, R21W.

After a thorough review of the EA, project file, public correspondence, Department policies, standards, guidelines, and the State Forest Land Management Plan (SFLMP), I have made the following decisions concerning this project.

1. ALTERNATIVE SELECTED

Two alternatives are presented and were fully analyzed in the EA:

- No-Action Alternative: Timber management activities and many of the associated road construction and improvement activities would not occur at this time. Depending on funding permanent access to the project area would be acquired and would entail: State acquiring 3.2 miles of right-of-way across private and 3.4 miles of road across U.S. Forest Service in addition to the state granting 1.9 miles of road to adjacent private. Minimal road maintenance on state roads might occur, dependent upon funding. Public uses of the project area for general recreation and firewood cutting would continue.

- Action Alternative: entails harvesting approximately 5.0 million board feet (MMBF) of timber from 996 acres, upgrading approximately 7.2 miles of existing roads, abandoning 3.5 miles and constructing 8.7 miles. Mechanical site preparation and hand planting of western larch and ponderosa pine would occur on a portion of the harvested acres assessed after logging.

Both Alternatives the No-Action and Action alternatives would:

- Meet the project objective to maintain and improve future opportunities for management activities and sustained revenue by developing a transportation plan that provides for legal access

I have selected the Action Alternative for implementation with the understanding that resource mitigation measures identified in the Environmental Assessment will be applied to meet the intended protection.

For the following reasons, the Action Alternative has been selected:

- The Action Alternative meets the Statement of Need and the specific project objectives on pages 1 and 2 of the EA.

- The No-Action Alternative foregoes a reasonable opportunity for generating revenue for the trusts, while the analyses of identified issues did not reveal information to persuade the Department to choose the No-Action Alternative prior to this decision.

- The Action Alternative includes activities to address concerns expressed by the public and local government entities with jurisdiction, including, but not limited to:

  1. Silvicultural prescriptions will remove trees infected with bark beetles and dwarf mistletoe, retain western larch and ponderosa pine in the overstory, reduce stand densities, and promote establishment of western larch and ponderosa pine in the understory, effectively maintaining or improving the growth and vigor of the forest stands.

  2. An adequate number of snags will remain in the project area to provide for important habitat for wildlife and recruitment for down woody debris.

  3. Forest stands immediately adjacent to residential properties will be treated to reduce fuel loadings reducing the potential for high intensity crown fires.

  4. Road improvements, construction and abandonment will replace a substandard road system with a road system with adequate surface drainage in place and one that is more easily maintained.

  5. 1.5% of big game winter range will be altered by timber harvesting, specifically reducing the quantity and quality of 25 acres of thermal cover. The independent actions of DNRC on this small percentage of winter range cannot effect a substantial change in overall winter range sustainability. Various patches of more closely spaced residual timber after harvest may still provide marginal thermal cover. Quality and quantity of thermal cover will improve on state land (within and outside winter range delineation) as crown development closes gaps in the tree canopy.

2. SIGNIFICANCE OF IMPACTS

I find that none of the project impacts are regarded as severe, enduring, geographically widespread, or frequent. Further, I find that the quantity and quality of various resources will not be adversely affected to a significant degree. I find no precedent for future actions that would cause significant impacts, nor do I find conflict with local, State, or Federal laws, requirements, or formal plans. In summary, I find that the identified adverse impacts will be avoided, controlled, or mitigated by the design of the project to an extent that they are not significant.

- Soil - With the Action Alternative, the risk of unacceptable levels of soil compaction or displacement is low because harvesting will occur

when soils are dry, frozen, or snow-covered. Ground disturbance would be limited by incorporating the use of old skid trails and roads in the general skidding plan. Prescribed mitigation measures will provide 10 to 15 tons per acre of downed woody debris for nutrient needs and erosion control. Impacts to soil resources are within the guideline standards in the SFLMP.

- Water Quality - Given the lack of surface water within the project area, the prescribed partial cutting for most of the harvest acres, the well drained soils and the prescribed mitigation measures, of retaining down woody debris, minimizing skid trails, and using slash and water bars to close skid trails, water quality is not expected to be adversely affected.

- Air Quality - Project-related activities on roads and pile burning in the harvest will not result in significant cumulative air impacts due to the timing of activities and compliance with the Montana Airshed Group.

- Vegetation - No old growth stands or sensitive plant species were identified on state land in the project area. On the 996 acres proposed for harvest, the proportion of western larch and ponderosa pine in stand species composition will increase as a result of retention of these species in the overstory and planting. General stand health (growth and vigor) will improve with the removal of diseased and insect infested trees and a reduction in overstory stocking. The reduction in ladder fuels, increased spacing between tree crowns, and a redistribution or reduction of ground fuels will lower the risk of high intensity wildfires.

- Noxious Weeds - Heavy equipment used for felling and skidding activities will be washed thoroughly before being brought on site. Areas disturbed will be seeded with a native grass seed mix concurrently with disturbance. Areas within the project area, currently infested with noxious weeds will be sprayed as part of the Weed Management Cooperative Agreement with Flathead County Weed District.

- Transportation/Access - Given the complexities of accessing state land through various ownerships in rocky, mountainous terrain the transportation plan provides for current and future access for the entire state ownership in the project area, with a minimum of roads. Standard and safety of the existing road system will be upgraded and improved for more cost efficient road use and maintenance and meet applicable Best Management Practices for forest roads.

- Wildlife - Habitat for threatened and endangered species is not currently provided and future use by these species is not expected. Retention and recruitment of western larch and ponderosa pine will improve sustainability of pileated woodpecker habitat.

- Human Health and Safety - The amount of truck traffic will increase on area roads.

- Economics - The proposed project should generate approximately $500,000 for the associated trust beneficiaries, using a formula that accounts

for both revenue and expenditures. Using values provided by the Bureau of Economic Research that 250 truck loads of logs provides 23 jobs and $765,000 income - the White's Basin Timber Sale should contribute to 103 jobs and generate $3,442,500 income.

- Locally Adopted Environmental Plans and Goals - In June 1996, DNRC began a phased-in implementation of the SFLMP. The SFLMP establishes the Agency's philosophy for management of forested trust land. SFLMP philosophy and appropriate resource management standards are incorporated into the design of the proposed project.

- Recreational Activities - The limited recreational opportunities will continue and will not be negatively affected by the proposed project.

- Precedent Setting and Cumulative Impacts - The project area is located on State-owned lands that are "principally valuable for the timber that is on them or for growing timber or for watershed protection," *(MCA 77-1-402)*. Since the EA does not identify future State actions that are new or unusual, the proposed timber sale project is not setting a precedent for a future action with significant impacts.

  Taken individually and cumulatively, the additional impacts of the proposed timber sale are negligible. Proposed activities are common practices and none of the project activities are being conducted on identified fragile or unique sites.

  The proposed timber sale project conforms to the management philosophies of DNRC and is in compliance with existing laws, policies, guidelines, and standards applicable to this type of proposed action.

3. **SHOULD DNRC PREPARE AN ENVIRONMENTAL IMPACT STATEMENT (EIS)?**

Based on the following, I find that an EIS does not need to be prepared:

- The EA adequately addresses the issues identified during project development and displays the information needed to make the decisions.

- Evaluation of the potential impacts of the proposed White's Basin Timber Sale indicates that no significant impacts would occur.

Finding Decision prepared by:
Beverly O'Brien, Kalispell Unit Forest Management Supervisor, DNRC

Beverly O'Brien — January 24, 2003

Signature — Date